EPA 510-K-94-001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN - 8 1994

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. John D. Barnes
Manager, Government and Public Affairs
Steel Tank Institute
570 Oakwood Road
Lake Zurich, IL 60047

Dear Mr. Barnes:

In late April 1994, the Steel Tank Institute (STI) notified the Environmental Protection Agency (EPA) of its desire to withdraw its request for EPA to relax the mandated frequency for monitoring the cathodic protection of federally regulated sti-P3® underground storage tanks (USTs). By return letter the Agency honored STI's request. The purpose of this letter is to respond to your letter of May 12, 1994 to Administrator Browner (copy enclosed) by which STI notified EPA of its desire to continue to seek relaxation of the federal requirement for monitoring cathodic protection systems on sti-P3® USTs. This letter also provides information on the Federal Register Notice of Data Availability, which solicited public comments on this issue and on the Tillinghast study. Enclosed are copies of the Federal Register notice and EPA's Comment-Response document.

Your May 12th letter states "The Notice of Data Availability (NDA) process was suggested to STI by the EPA Office of Underground Storage Tanks (OUST) as a way to accomplish the amendment of the monitoring mandate...." This statement is misleading. In response to STI's request for relaxation of the monitoring requirement, EPA voluntarily chose to publish a NDA as a mechanism to obtain public comment and a broader perspective on the technical issue under consideration, and as one of several sources of information to be used in the Agency's deliberative process. At no time was there a presumption that publishing the NDA would mean that the Agency intended to relax the requirement or that it was a necessary precondition to making such a change should the Agency decide to do so.

We have carefully reviewed STI's arguments, the Tillinghast study and all other information submitted to the docket as of the end of January, 1994. The Agency has decided not to take any action at this time to relax the frequency requirement for cathodic protection monitoring of sti-P3® tanks.

BACKGROUND

In 1992, STI and its members requested that EPA relax the frequency requirement for ongoing cathodic protection monitoring of certain regulated USTs. This requirement, found at 40 CFR 280.31(b)(1), requires that "all cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency...." STI requested that EPA, as an implementing agency, alter the required frequency for sti-P3® tanks to be at the time of installation and subsequently only after any disturbance of the excavation into which the tank had been placed. EPA indicated that it did not have data sufficient to support relaxing the requirement at that time.

STI then contracted with Tillinghast, a Towers Perrin Company, to perform a study of the issue and provide a report of the findings. EPA, after informing STI of its intentions to do so, made the report, titled "Evaluation Of The Potential For External Corrosion And Review Of Cathodic Protection Monitoring Associated With sti-P3® Underground Storage Tanks," available to the public. Although not required to, on October 25, 1993, EPA published a Notice of Data Availability in the Federal Register and requested public comments on the report. The comment summaries and EPA's responses provided in the enclosed document.

DISCUSSION

STI and its members asserted that the required frequency for cathodic protection monitoring of sti-P3® tanks should be relaxed for the following reasons:

- sti-P3®'s excellent performance record;
- Cathodic protection monitoring duplicates the effort of the required monthly leak detection checks;
- Regulatory inequity between existing steel tanks without corrosion protection, which are not subject to the requirement, and sti-P3® tanks;
- Periodic deflection monitoring for fiberglass-reinforced plastic (FRP) tanks is not required;
- Tendency for the monitoring requirement to affect UST

buyers' choices;
- o Industry's high cost of compliance; and
- o Lack of regulatory enforcement efforts directed at cathodic protection and its monitoring.

EPA's responses are summarized below. For additional discussion, see the enclosed Comment-Response document.

sti-P3®'s performance record

The information provided to EPA from STI and other sources shows that, to date, sti-P3® tanks appear to have a very good record of not failing due to external corrosion. However, there are several reasons why the data presented by STI are not compelling enough to warrant relaxation of the monitoring requirement at this time. The first is the youth of the installed sti-P3® tanks relative to their expected service life. No sti-P3® tank has been in the ground for a period of time equal to the current 30-year warranty period. The vast majority of the more than 200,000 sti-P3® tanks installed are less than nine years old. Though the Tillinghast report provided some information on older tanks (registered 1970-75), the information in the report is largely from the more common younger tanks. Indeed, compelling data may not exist at this time, due to the relative youth of the sti-P3® population. Secondly, and importantly, cathodic protection monitoring data show that eight percent or more of tanks tested cannot be shown with certainty to meet the industry standard for cathodic protection. This does not mean that these tanks are corroding, but it does mean that, for whatever reason, there is not certainty that they are not. Finally, as the Tillinghast report and many commenters pointed out, problems with sti-P3® tanks due to external corrosion have been documented.

Cathodic protection monitoring and the required monthly leak detection checks

The cathodic protection monitoring requirement, while it shares some similarities with the leak detection monitoring requirements, serves a fundamentally different purpose, and therefore does not duplicate the leak detection effort. Cathodic protection systems and the requirements for monitoring them are designed to reduce the likelihood that any release from an UST will occur and is, therefore, a method of pollution prevention. Leak detection monitoring helps reduce the chances that a leak will become significant, but in general is not designed to reduce the likelihood of a leak.

Regulatory requirements for existing steel tanks without corrosion protection and for cathodically protected USTs

While it is true that the UST regulations do not require monitoring of existing steel tanks without corrosion protection ("bare steel tanks") and that they can continue in service until 1998, this does not warrant relaxation of the requirements for cathodically protected steel tanks. EPA still believes, as it did when the final technical rule was promulgated in 1988, that even though bare steel tanks pose a significant environmental threat, a compliance period of less than 10 years for replacing or upgrading these tanks was not feasible due to the large universe of unprotected tanks. The same considerations did not, and still do not, apply to cathodically protected tanks. No one contends that there are not enough testers available to meet the required frequency, and as discussed below, once a tank is cathodically protected, complying with the monitoring requirements does not pose an undue burden on the regulated community. Meanwhile, it is important for cathodically protected tanks to be monitored, to ensure that they are indeed protected, and to ensure that they do not add to the threat already posed by existing bare steel tanks. EPA also would like to note that any apparent inequity caused by the monitoring requirement is diminished by the fact that bare steel tanks must be replaced, upgraded, or closed by 1998, at significant expense to the owner or operator, while sti-P3® tanks (with spill and overfill equipment) need not be.

Deflection monitoring for fiberglass-reinforced plastic (FRP) tanks

While it is true that FRP tanks are not subject to ongoing tank wall deflection monitoring to ensure protection against structural failure, the Agency believes that this is not a valid reason to eliminate or reduce the cathodic protection monitoring requirement for sti-P3® tanks. Tank wall deflection in FRP tanks is a fundamentally different physical phenomenon from external corrosion of steel tanks. Because each tank technology is different, EPA imposed technical standards which require testing methods and frequencies specific to the technology used. Therefore, such comparisons are not persuasive.

The monitoring requirement and UST buyers' choices

In response to concerns that the cathodic protection monitoring requirement affects buyers' choices, this influence may occur, but EPA believes it is only one of several factors that have led to changes in the market shares for various tank technologies over the past few years. EPA believes that all the technologies allowed in the final technical rule (40 CFR 280.20), when operated in accordance with EPA regulations, are protective of human health and the environment. As for cathodically protected steel tanks, STI's proposal implicitly recognizes (i.e., by supporting monitoring when conditions suggest that the system may be compromised), that the sti-P3® tank is fully protective only if the cathodic protection system is operating properly. For the reasons set out in this letter and the Comment-Response document, EPA believes that monitoring every three years is a reasonable, and not particularly burdensome, way to ensure that the system is fully protective. In addition, monitoring can be viewed as a benefit to potential customers, because it ensures that an owner's equipment is performing as it should.

Industry's cost of compliance

As stated in the preamble to the final UST technical rules, EPA recognizes that the UST community in large part is composed of small businesses with limited resources and that, wherever possible, EPA's rules should accommodate this fact. See 53 Fed. Reg. 37084 (Sept. 23, 1988). The Agency believes that the present monitoring requirement does not contravene this operating principle, because the information before EPA demonstrates that cathodic protection monitoring is easy to perform and inexpensive relative to other costs of operating USTs, and especially relative to costs of pollution remediation. Regarding ease of use, problems commonly reported with monitoring often can be rectified by relatively simple means. Regarding costs, the information EPA received shows that cathodic protection monitoring costs generally range from $95 up to a few hundred dollars for a typical location with three tanks. This cost, incurred every three years, is insignificant relative to many other expenses involved in installing and operating USTs. In addition, monitoring is very inexpensive in terms of both time and money relative to the costs of cleaning up a leak. EPA believes that the effort and costs of monitoring are reasonable, do not pose an unnecessary burden, and may save owners and operators from significant expenses in the long run.

Regulatory enforcement efforts directed at cathodic protection and its monitoring

Enforcement priorities for UST systems may differ state by state. However, the extent of current enforcement activity does not determine the need for cathodic protection monitoring. In many states, enforcement of the leak detection requirements has priority over the cathodic protection monitoring requirements, partly because of the earlier deadlines for all tanks to be in compliance with the leak detection requirements. However, with the upcoming 1998 compliance deadline for corrosion protection of all regulated USTs, the emphasis likely will shift to include more vigorous enforcement of the cathodic protection monitoring requirements. EPA believes that cathodic protection monitoring is an important component of pollution prevention for USTs.

CONCLUSION

In addition to the fact that the Agency is unpersuaded by STI's arguments addressed above, it is important to note that STI seeks a relaxation of the monitoring frequency despite the fact that the Tillinghast report was not able to come to any conclusion regarding an appropriate frequency. STI's position that post-installation monitoring should be limited to instances of disturbance of the excavation, without supporting data and/or analyses, is unpersuasive. This is because site conditions which can affect the performance of the anodes can occur or change without the owner or operator's knowledge (e.g., stray currents that may overpower anodes). Therefore, absent data that would alleviate this concern, the Agency cannot say that STI's proposed frequency would be, as EPA determined in promulgating the current 3-year monitoring frequency, "sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion" (see, 53 FR 37137).

Furthermore, EPA's decision not to relax the cathodic protection monitoring requirement also is strongly supported by the fact that several national standards, from both industry and government, place stricter requirements on cathodic protection monitoring than do EPA's UST regulations. Please see the enclosed table comparing several national standards' cathodic protection monitoring requirements.

In short, EPA believes that the information before it is not compelling enough to warrant relaxation of the cathodic protection monitoring requirement at this time. EPA continues to believe that steel tanks, protected from corrosion according to both industry standards and Agency regulations, remain protective

of human health and the environment. The fact that cathodic protection monitoring of sti-P3® tanks is possible and required means that owners and operators are likely to make sure that the environment - and their investment - remains protected.

A copy of this letter and of EPA's Comment-Response document will be sent to all those who have expressed interest in this issue, including those who submitted written comments.

Sincerely yours,

David W. Ziegele, Director
Office of Underground Storage Tanks

Enclosures:

1. May 12, 1994 letter from John Barnes, STI
2. Federal Register Notice of Data Availability
3. EPA Comment-Response document
4. Table of Standards for Cathodic Protection Monitoring

cc: State UST Program Managers (without Encl. 3)
UST/LUST Regional Program Managers
UST/LUST Regional Branch Chiefs (without Encl. 2 and 3)
Dawn Messier, OGC
Susan O'Keefe, OECA/RCRA
OUST Management Team (without enclosures)

STIRepl3.W51

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 28 1994

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Wayne Geyer
Executive Vice President
Steel Tank Institute
570 Oakwood Road
Lake Zurich, IL 60047

Dear Mr. Geyer:

Thank you for your letter of April 22, 1994, by which the Steel Tank Institute withdraws its request for the Environmental Protection Agency to alter the mandated frequency for monitoring cathodic protection monitoring of federally-regulated sti-P3 underground storage tanks. By this letter, the Agency honors your request without prejudice.

Sincerely,

David W. Ziegele

David Ziegele, Director
Office of Underground Storage Tanks

cc: EPA UST/LUST Regional Program Managers
EPA UST/LUST Regional Branch Chiefs
EPA Office of General Counsel
State UST Program Managers

Steel Tank Institute
570 Oakwood Road
Lake Zurich, IL 60047
708/438-TANK (8265)
708/438-8766 (Fax)

April 22, 1994

Mr. David Ziegle
Director
Office of Underground Storage Tanks
Environmental Protection Agency
401 M Street, S.W. (OS-410-WF)
Washington, D.C. 20460

Dear Mr. Ziegle:

The Steel Tank Institute requests that the Environmental Protection Agency Office of Underground Storage Tanks terminate the *Federal Register* Notice of Data Availability process as regards the cathodic protection monitoring of the sti-P_3® underground storage tank.

Thank you.

Sincerely,

Wayne Geyer
Executive Vice President
Steel Tank Institute

Steel Tank Institute
570 Oakwood Road
Lake Zurich, IL 60047
708/438-TANK (8265)
708/438-8766 (Fax)

May 12, 1994

The Honorable Carol Browner
Administrator
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Administrator Browner:

On April 22, 1994, the Steel Tank Institute (STI) requested that the Environmental Protection Agency (EPA) terminate the *Federal Register* Notice of Data Availability (NDA) process as regards the cathodic protection monitoring of the sti-P_3® underground storage tank. Please see enclosed letter.

The Notice of Data Availability process was suggested to STI by the EPA Office of Underground Storage Tanks (OUST) as a way to accomplish the amendment of the monitoring mandate on the sti-P_3® underground storage tank.

It only recently became apparent that STI's goals were not going to be accomplished through the NDA process... therefore we withdrew our request that the NDA process move forward. EPA agreed to do so without prejudice. Please see enclosed letter from David Ziegele, Director of OUST.

The purpose of this letter is to notify your office that STI continues to seek the amendment of the cathodic protection monitoring mandate on the sti-P_3® underground storage tank to require a test at the time of installation... or if an excavation is disturbed by construction or retrofit activity.

The membership of STI looks forward to working with you on this issue. Our interest is the same as yours... the protection of human health and the environment.

Sincerely,

John D. Barnes
Manager of Government and Public Affairs
Steel Tank Institute

cc. Elliott Laws, Assistant Administrator for Solid Waste and Emergency Response
David Ziegele, Director, Office of Underground Storage Tanks

Name	Case No.
Goldie's Texaco	RF321-17189
Hazel Park City SD	RF272-87063
Iren S. Light, Inc	RF300-18479
Jefferson Davis Par. School Board	RF272-87385
Jones Texaco Service	RF321-16997
Lehigh Portland Cement Company	RF315-10203
Mohawk Rubber Company	RF272-86061
Petroleum Products, Inc	RF321-16945
Siders Texaco Station	RF321-16992
Spreckles Sugar Co	RF315-10202
SRO Paving, Inc	RF272-76151
Village of Oak Lawn	RF272-87463
Wythe County Public School	RF272-87059

Copies of the full text of these decisions and orders are available in the Public Reference Room of the Office of Hearings and Appeals, room 1E-234, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC. 20585, Monday through Friday, between the hours of 1 p.m. and 5 p.m., except federal holidays. They are also available in Energy Management: Federal Energy Guidelines, a commercially published loose leaf reporter system.

Dated: October 19, 1993.

George B. Breznay,

Director, Office of Hearings and Appeals.

[FR Doc. 93-26173 Filed 10-22-93; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

[FRL-4791-5]

Evaluation of the Potential for External Corrosion and Review of Cathodic Protection Monitoring Associated With sti-P3 Underground Storage Tanks Data Availability

AGENCY: Environmental Protection Agency.

ACTION: Notice of data availability.

SUMMARY: The Environmental Protection Agency (EPA) is today publishing a notice of data availability regarding a report completed by Tillinghast, a Towers Perrin Company, on behalf of the Steel Tank Institute (STI). The Tillinghast report examines the potential for external corrosion of sti-P3 underground storage tanks (USTs) as well as owners' and operators' corrosion monitoring practices for USTs. The Agency's current regulations for corrosion monitoring require periodic post-installation monitoring of cathodically protected steel underground storage tanks. The Steel Tank Institute approached EPA in 1992, requesting it alter the mandated monitoring frequency for cathodic protection monitoring of steel USTs, and specifically, USTs manufactured by STI members under the "sti-P3" specification. EPA responded by agreeing to consider data supplied by an independent, third-party examination of STI's initial findings, as part of an overall data collection process. This notice summarizes the methodology, findings, and conclusions of the study. EPA encourages public review and comment on the Tillinghast report, as it may be used in arriving at a final determination regarding STI's request for EPA to modify the current requirements for cathodic protection monitoring for steel underground storage tanks.

DATES: Written comments on this notice must be submitted on or before December 27, 1993.

ADDRESSES: Written comments on today's supplemental notice should be addressed to the docket clerk at the following address: U.S. Environmental Protection Agency, RCRA Docket (OS-305), 401 M Street, SW., Washington, DC 20460. One original and two copies of comments should be sent and identified by regulatory docket reference number UST 2-9. The docket is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. Docket materials may be reviewed by appointment by calling (202) 260-9327. Copies of docket materials may be made at no cost, with a maximum of 100 pages of material from any one regulatory docket. Additional copies are $0.15 per page. For a copy of the Tillinghast report, contact the EPA RCRA Docket.

FOR FURTHER INFORMATION CONTACT: For general information about this supplemental notice, contact the RCRA/Superfund/OUST Hotline, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency Washington, DC 20460, (800) 424-9346 (toll-free) or (703) 412-9810 (local). For the hearing impaired, the number is (800) 553-7672 (toll-free). For further information, contact Amy Hazeltine in the Office of Underground Storage Tanks at (703) 308-8898.

SUPPLEMENTARY INFORMATION:

I. Background

A. Technical Requirements for Underground Storage Tanks

Final regulations for Underground Storage Tanks (USTs) containing regulated substances were promulgated by the Agency in September and October, 1988 and became effective in December, 1988 and January, 1989. The regulations include technical requirements for new and existing underground storage tanks and piping, financial responsibility requirements for UST owners and operators, and state program approval requirements. In order to prevent releases, EPA included in the technical requirements four important categories of preventative measures: (1) Tank design and installation, (2) release detection, (3) corrosion protection, and (4) spill and overfill control. All UST systems installed after December 22, 1988 must meet Federal requirements immediately. Owners of tank systems installed on or before that date have until December 22, 1998 to either upgrade their tanks with corrosion protection and spill and overfill devices, replace them with new tank systems, or close them in accordance with the regulatory requirements.

According to a study conducted for EPA in 1987, corrosion of tanks and piping was a major cause of UST system releases. At that time, most installed USTs and piping were constructed of "bare steel"—steel without corrosion protection. When buried in the ground, steel without corrosion protection can be destroyed by external corrosion, resulting in leaks. One type of corrosion protection is cathodic protection, which is a technique to prevent corrosion of a surface by making that surface the cathode of an electrochemical cell. For UST systems, this can be done by

applying either galvanic anodes or impressed electric current.

The UST regulations include requirements for the operation and maintenance of corrosion protection of steel UST systems. As part of these requirements, owners and operators of steel UST systems equipped with cathodic protection must ensure that all cathodic protection systems are tested within 6 months of installation and at least every 3 years thereafter, or according to another reasonable time frame established by the implementing agency. See 40 CFR 280.31(b)(1). The Preamble to the rule noted that, after consultation with groups of industry experts during the public comment period, EPA now agrees with the commenters who recommended that all cathodic protection systems should be tested at the same frequency and the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion. EPA understands that this time interval is consistent with sound practice as is now recommended in the recently revised NACE (National Association of Corrosion Engineers) code and by major tank manufacturers. See 53 FR 37137.

B. Steel Tank Institute Request and Study Report

The Steel Tank Institute (STI) is a trade organization comprised of steel tank manufacturers. STI members manufacture pre-engineered underground storage tanks built to the "sti-P3" specification, for storage of liquids at atmospheric pressure. Tanks meeting the sti-P3 specification employ three types of corrosion protection: (1) Dielectric coating, (2) electrical isolation, and (3) cathodic protection through factory-installed anodes. More than 200,000 sti-P3 tanks have been fabricated and placed in use since 1969, the vast majority since 1985, and they are commonly installed today.

Single-wall sti-P3 tanks in service for storage of Federally regulated substances are covered by the cathodic protection monitoring requirements outlined above. Those tank owners who installed sti-P3 tanks in Federally regulated service between late 1988 and February of 1993 were eligible to enroll in STI's "Watchdog" cathodic protection monitoring service. The Watchdog service, performed through STI, provides cathodic protection monitoring in compliance with the EPA requirements. Since February of 1993, a simplified, user-friendly cathodic protection monitoring test system with a buried reference cell is installed with new sti-P3 tanks subject to Federal UST regulations. Those sti-P3 systems installed prior to 1988 have been operated without cathodic protection monitoring in most cases.

In the spring of 1992, STI requested that EPA alter the frequency of cathodic protection monitoring from the current requirements, to monitoring within 6 months of installation and subsequently only after any disturbance of the excavation (e.g., retrofit of Stage II vapor recovery systems). Periodic monitoring would therefore not be required. STI provided data on the performance of sti-P3 tanks and on potential costs for cathodic protection monitoring of sti-P3 tanks in support of its request.

STI and its members believe that the mandated frequency for cathodic protection monitoring should be changed for the following reasons:

* The sti-P3 tank has a very good performance record;
* The much more frequent monthly leak detection checks required by the UST regulations supersede the need for cathodic protection monitoring;
* There is inequity in that thousands of existing steel tanks without corrosion protection, which are much more likely to fail before phase-out in 1998, are not subject to the cathodic protection monitoring requirement;
* Periodic tank deflection monitoring for fiberglass-reinforced plastic (FRP) tanks was not required in EPA's UST regulations due to the low incidence of failure in FRP tanks (less than 0.5 percent), and sti-P3 tanks have similarly low failure rates;
* UST buyers consider cathodic protection monitoring and the associated recordkeeping required with steel tanks to be an inconvenience, and this affects buyers' choices among UST technologies;
* There is a high cost of compliance to industry; and
* Regulatory enforcement efforts are directed at clean-ups and leak detection, not cathodic protection—an indicator that monitoring cathodic protection is not an essential activity towards protecting human health and the environment.

The Agency took no regulatory action in response to STI's request and the supporting information. STI asked Tillinghast, an international risk management and actuarial consulting firm with experience in underground storage issues, to conduct an independent, third-party audit of STI's data. In May of 1993, STI provided the Agency with a report prepared by Tillinghast titled "Evaluation Of The Potential For External Corrosion And Review Of Cathodic Protection Monitoring Associated With sti-P3 Underground Storage Tanks." An abstract of the report follows.

The pollution prevention components of the UST regulations (including corrosion protection) are very important to the UST program. Therefore, the Agency has decided to publish this Notice of Data Availability and solicit public comment on the report to ensure a more complete understanding of the issue at hand. This Notice includes several questions to help guide public discussion. The Agency is interested in responses to any of the questions listed below, and other issues the public may identify, such as the costs/benefits of the monitoring requirement itself.

II. Abstract

In May 1993, Tillinghast completed a study on behalf of the Steel Tank Institute (STI) which surveyed tank owners, tank installers, and regulators to identify any instances of failures of sti-P3 tanks attributed to external corrosion and to obtain experience information on cathodic protection monitoring practices. A summary of Tillinghast's methodology, findings, and conclusions follows.

Methodology

Tillinghast telephone-surveyed randomly selected sti-P3 underground storage tank (UST) owners and tank installers as well as Federal and State UST regulators about the condition and general maintenance of sti-P3 tanks. These individuals, along with data from the STI Watchdog program (a corrosion monitoring program initiated by STI in 1988 to assist tank owners in complying with EPA corrosion monitoring requirements) provided information on the frequency, conditions, and other aspects of the cathodic protection monitoring practices for sti-P3 tanks. In addition, the survey sought performance history on sti-P3 tanks which were not subject to cathodic protection testing. Tillinghast also examined environmental impairment, warranty, and product liability insurance claims from the Steel Tank Insurance Company (STICO, a captive insurance company formed by steel tank manufacturers).

Tillinghast selected a sample of owners and installers through STI's computer data base containing over 200,000 registered tanks. The sample covered the following nine states: Washington, Virginia, Vermont, South Dakota, Colorado, Florida, Texas, Missouri and Kentucky. The nine states

represented a variety of climates, tank environments, saturation periods, water tables, and soil conditions. Tillinghast's sample also included a variety of tank sizes (from 500 to 20,000 gallons) and contained petroleum marketers and non-marketers. Tillinghast examined the following registration periods: 1970–75, 1980–81, 1985, and 1990. The examined registration periods began in 1970 when sti-P3 tanks first became well known to owners/operators and continue to the present.

Tillinghast successfully contacted 110 owners with immediate supervision over 385 sti-P3 tanks and secondary responsibility for approximately 2500 sti-P3 tanks at other locations. In addition, researchers contacted 37 installers throughout the geographic sample who had experience in over 5000 sti-P3 tank installations. Finally, Tillinghast contacted the Environmental Protection Agency's ten Regional UST offices as well as each of the nine State UST regulatory offices included in the sample.

Tillinghast obtained summary information on 103 environmental impairment and product liability insurance closed claims for sti-P3 tanks from STICO to identify any instances where payment was made due to a product release. Tillinghast also randomly selected eight of the 103 claims to specifically review the "cause of incident" data.

Findings

Tillinghast identified findings related to the following areas: Testing of cathodic protection systems, cathodic protection monitoring practices, environmental and product liability claims, and understanding of and compliance with EPA's technical requirements.

Tillinghast's survey of tank owners and installers covered over 8,000 sti-P3 tanks. Within the surveyed population, respondents reported three instances of sti-P3 tank external corrosion—one of which involved a product release. Of the regulators Tillinghast surveyed, those who had witnessed the removal of sti-P3 tanks reported that the tanks and sacrificial anodes were in "excellent condition upon removal." Regulators did not provide information on the ages of the tanks that were considered to be in "excellent condition upon removal."

Tillinghast reported that corrosion monitoring requirements (and the technical basis for those requirements) are not well understood by most tank owners, installers, or regulators. Furthermore, Tillinghast reported that unless an sti-P3 owner/installer signed up for STI's Watchdog program, cathodic protection monitoring for sti-P3 tanks installed since the promulgation of EPA's technical regulations was generally not being performed, although some large sti-P3 tanks users did perform independent testing.

Tillinghast's review of data from STI and from owners' research indicated that test variability can be high for corrosion monitoring tests conducted on any given site. Watchdog participants and major oil companies (many of whom conduct their own corrosion monitoring) reported few readings less than the 850 millivolt compliance point for corrosion monitoring. Tillinghast identified human error (in tank installation or testing) as one cause for obtaining disreputable corrosion monitoring results. Unusually dry soil conditions and other physical factors also influenced the accuracy of cathodic protection system testing.

Tillinghast obtained data from installers, tank owners, and major oil companies on the annual cost of corrosion monitoring. The data showed the annual cost of corrosion monitoring to range from $130 to $500 per location (each location having an average of 3.2 tanks). The impact of these costs was greatest on small, single location owners due to the necessity of hiring a contractor to travel to the site to perform the monitoring.

Tillinghast's investigation of STICO limited warranty and environmental and product liability insurance closed claims revealed that most of the sti-P3 claims that entailed both administrative and investigative costs involved improper installation techniques or errors in tank manufacturing workmanship. Fifty-six of the 103 claims incurred administrative expense but no claims costs or expenses, leaving 47 others which incurred some sort of investigative cost (e.g., tightness test). Only four of the 47 incidents in which investigative cost was incurred actually involved a claims payment. Tillinghast's review of eight randomly chosen closed claims for "cause of incident" data demonstrated that a pattern of faulty workmanship, bad installation, or a combination of both resulted in corroded sti-P3 tanks.

Conclusions

Tillinghast found no instances of external corrosion of sti-P3 tanks that had been properly fabricated, transported, and installed. Of the more than 8000 sti-P3 tank installations represented by owners and installers, only three instances of external corrosion were reported, a frequency of 0.04%, and only one involved a product release. Tillinghast did not have enough corrosion monitoring data to statistically determine an optimum monitoring frequency for cathodic protection. Tillinghast's survey concluded that less than 10% of the Watchdog participants or major oil companies who maintain their own corrosion monitoring programs and installed sti-P3 tanks in 1990, reported readings below the 850 millivolt compliance point for corrosion monitoring. Finally, Watchdog monitoring data from 1991, 1992, and the first quarter of 1993 indicate that based on cathodic protection monitoring readings, the number of sti-P3 tanks with cathodic protection readings of −850 millivolts or greater is increasing.

III. Public Comments

EPA is interested in any comments that the public may have on the content of this report, and is especially interested in any additional quantitative data commenters may provide. In particular, the Agency is interested in receiving answers to the questions listed below.

* What data are available that confirm or refute the report's findings on corrosion protection of sti-P3 USTs? In particular, have problems with corrosion protection (such as external corrosion) on sti-P3 tanks been observed? If so, what were the numbers, types, severity, and impacts of these problems? What were the ages of any sti-P3 tanks with problems with corrosion protection, and were these problems caused during, before, or after installation? What are the sti-P3 label numbers, if available, for verification purposes?

* For any sti-P3 tanks observed to have problems with corrosion protection, including tanks and piping, did cathodic protection monitoring indicate a lack of protection? If so, when was a lack of protection found—within 6 months of installation or during a later test? If monitoring was not performed, would it have indicated a lack of protection if it had been done?

* What data are available addressing the above issues for cathodically protected steel USTs that are not sti-P3 USTs? If problems were observed, were they observed with field installed or with factory installed cathodic protection systems?

* What information is available confirming or refuting the study's representation of the costs and benefits of cathodic protection monitoring of UST systems?

* How does the simplified, permanently installed cathodic protection monitoring system, now installed with new Federally regulated

sti-P3 tanks, change cathodic protection monitoring practices and its costs and benefits?

* If the study were performed 10 years later and again 20 years later, would the findings be expected to be the same? Why or why not?

* What experiences or studies in other applications of cathodic protection may provide insights into the long-term performance of cathodic protection on USTs and the costs and benefits of cathodic protection monitoring?

IV. Schedule for Final Determination

After review and evaluation of the public comments on this notice, EPA will conduct internal deliberations to arrive at a final determination of the Agency's position on the required frequency of cathodic protection monitoring. The Agency plans to reach a determination within 120 days after the conclusion of the comment period. This determination may take the form of no action, guidance, changes to the technical regulations, or some other regulatory action.

Dated: September 20, 1993.

Richard J. Guimond,

Acting Assistant Administrator.

[FR Doc. 93-26160 Filed 10-22-93; 8:45 am]

BILLING CODE 6560-60-P

[FRL-4793-8]

National Advisory Council for Environmental Policy and Technology of the Policy Integration Project, Lead Subcommittee; Meeting

AGENCY: Environmental Protection Agency.

ACTION: Notice.

SUMMARY: Pursuant to the Federal Advisory Committee Act (Pub. L. 92-463) the Environmental Protection Agency (EPA) gives notice of a meeting of the Lead Subcommittee of the Policy Integration Project of the National Advisory Council for Environmental Policy and Technology (NACEPT). The Lead Subcommittee meeting will be held on November 9th and will discuss draft-working papers on selected topics, which will be used as background for the Subcommittee's Report. The Subcommittee will also receive a briefing from a representative of the Occupational Safety and Health Commission (OSHA) on recent policy activities related to occupational lead exposures. The Committee will also be scheduling its next meeting, which will be held early in December, 1993. The purpose of the December meeting will be to discuss the draft report to be presented to the EPA Administrator.

DATES: The Subcommittee will meet on November 9, 1993. The meeting will start at 9 a.m. and end at 4:30 p.m.

ADDRESSES: Hall of States, 444 North Capitol Street, NW., Washington, DC 20001-1572.

The meeting is open to the public, with limited seating available on a first-come, first-served basis.

FOR FURTHER INFORMATION CONTACT: Mr. Robert L. Hardaker, Designated Federal Office, U.S. EPA, Office of Cooperative Environmental Management, telephone (202) 260-9741.

Dated: October 20, 1993.

Robert L. Hardaker,

Designated Federal Official, NACEPT-Lead Subcommittee.

[FR Doc. 93-26161 Filed 10-22-93; 8:45 am]

BILLING CODE 6560-60-M

FEDERAL COMMUNICATIONS COMMISSION

Public Information Collections Approved by Office of Management and Budget

The Federal Communications Commission (FCC) has received Office of Management and Budget (OMB) approval for the following public information collections pursuant to the Paperwork Reduction Act of 1980, Pub. L. 96-511. For further information contact Shoko B. Hair, Federal Communications Commission, (202) 632-6934.

Federal Communications Commission

OMB Control No.: 3060-0515
Title: Miscellaneous Common Carrier and Record Carrier Annual Letter Filing Requirement—Section 43.21(d)
Expiration Date: 09/30/95
Estimated Annual Burden: 33 total hours; 1.43 hours per response.
Description: Pursuant to 47 CFR 43.21(d) each miscellaneous common carrier with operating revenues over $100 million for a calendar year shall file with the Common Carrier Bureau Chief a letter showing its operating revenues for that year and the value of its total communications plant at the end of that year. Each record carrier with operating revenues over $75 million for a calendar year shall file a letter showing selected income statement and balance sheet items for that year with the Common Carrier Bureau Chief. These letters must be filed by March 31 of the following year.

OMB Control No.: 3060-0470
Title: Computer III Remand Proceedings: Bell Operating Company Safeguards and Tier 1 Local Exchange Company Safeguards, (CC Docket No. 90-623) and Implementation of Further Cost Allocation Uniformity (MO&O).
Expiration Date: 07/31/95
Estimated Annual Burden: 27,000 total hours; 300 hours per response.
Description: Section 64.903 of the Commission's rules requires local exchange carriers with annual operating revenues of $100 million or more to file cost allocation manuals. The manuals are used by Commission staff to detect improper cross-subsidization. In the Memorandum Opinion and Order (MO&O) in AAD 92-42, (released 7/1/93), the Acting Chief, Common Carrier Bureau under delegated authority implemented cost allocation uniformity requirements. The MO&O clarifies distinction among apportionment methods; establishes a minimum number of cost pools for ten accounts; standardizes allocation procedures for those accounts; disaggregates mandated cost pools into additional pools; and, sets implementation. Local exchange carriers are required to file a revised cost allocation manual by 11/1/93 pursuant to the requirements contained in the MO&O and in Responsible Accounting Officer Letter No. 19.

OMB Control No.: 3060-0400
Title: Tariff Review Plan
Expiration Date: 06/30/96
Estimated Annual Burden: 1,840 total hours; 40 hours per response.
Description: Certain local exchange carriers are required annually to submit a Tariff Review Plan in partial fulfillment of cost supported material required by 47 CFR part 61. The information is used by FCC and the public to determine the justness and reasonableness of rates, terms and conditions in tariffs as required by the Communications Act of 1934, as amended.

OMB Control No.: 3060-0484
Title: Amendment of Part 63 of the Commission's Rules to Provide for Notification by Common Carriers of Service Disruptions (Section 63.100)
Expiration Date: 06/30/96
Estimated Annual Burden: 129 total hours; 2.3 hours per response.
Description: Section 63.100 of the Commission's rules requires that local exchange and interexchange common carriers that operate either transmission or switching facilities file service disruption reports whenever telephone services provided by their networks are

ENCLOSURE 3

SUMMARY OF COMMENTS AND EPA RESPONSES
Notice of Data Availability in the Federal Register, October 25, 1993

The Agency received 228 comments in response to the Notice of Data Availability published in the Federal Register, October 25, 1993. In general, the commenters represent the manufacturers, distributors, and installers from the steel tank, petroleum equipment, and fiberglass and composite tank industries. A list of the commenters is attached.

The comment summaries and EPA's responses are organized into seven sections. The organization of the document is provided below.

1. General Support or Opposition

One commenter (Corrosion Associated, Inc.) feels that the impetus for revising the current monitoring requirement has been pressure from lobbyists who are trying to sell more steel tanks. He cautions the Agency to get input on the matter from corrosion experts. One commenter (Fiberglass Petroleum Tank & Piping Institute) implies that some of the impetus for the request to modify the monitoring requirement has been declining sales of sti-P3® tanks. The commenter argues that the Agency should not consider the Steel Tank Institute's request for elimination of cathodic protection monitoring requirements because its mission is to protect health and the environment, not to protect one product from competition.

Several commenters (Corrosion Associates, Inc.; Association of State and Territorial Solid Waste Management Officials [ASTSWMO]) noted that the sti-P3® tanks are still new enough that leaks due to corrosion have not been a big problem. Another commenter (NACE International) adds that its experience indicates that the average time between installation and failure of unprotected bare steel tanks is between eight and 12 years. The commenter feels that it is possible that more sti-P3® tank failures will occur in the next few years. Another commenter (New York State Department of Environmental Conservation) indicated that problems with bare steel tanks generally take 18 years to become evident. The commenter suggested that sti-P3® tanks have not yet been time tested, and that problems with the tanks will very likely occur in approximately 10 years. One commenter (Marcel Moreau Associates) noted that a proper assessment of the tanks' performance cannot be made until the tanks have been in the ground for approximately 20 years. All of these commenters argued that continued monitoring is necessary until sti-P3® tanks have been time tested.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) says that the Tillinghast report does not say whether tanks will be able to resist corrosion over the 30-year tank design life. Only 53 of the 384 tanks in the sample were over ten years old. The commenter notes that even bare steel tanks generally do not develop corrosion failures for at least 10 years. The commenter therefore feels that the Tillinghast report does not prove anything.

Many commenters[1] stated that the Steel Tank Institute gives a 30-year warranty on the sti-P3® tanks. These commenters felt that the length of this warranty indicates the soundness and dependability of the sti-P3® tank. However, another commenter (Xerxes Corporation) states that the Steel Tank Institute's 30 year guarantee is immaterial to whether cathodic protection should be monitored. This commenter argues that the cathodic protection system is on the tank to insure that the tank fulfills this service life, and the monitoring is designed to audit the functioning of the cathodic protection system. Another commenter (Green Environmental & Corrosion, Inc.) states that from an engineering perspective, all engineered systems, including all tank technologies, require monitoring.

Another commenter (Fiberglass Petroleum Tank & Pipe Institute) provided copies of six articles published in the last few years in Tank Talk, a Steel Tank Institute-published

newsletter about USTs. Collectively, the articles show that the Steel Tank Institute has in the past supported cathodic protection monitoring as an effective, inexpensive means of preventing leaks. This commenter notes that many national standards support cathodic protection monitoring. The standards cited by the commenter were: NACE International, Canadian Council of Ministers of the Environment, National Standard of Canada, Petroleum Equipment Institute, American Petroleum Institute, National Fire Protection Association, and the Uniform Fire Code. The commenter notes that there are two significant areas in which the Agency's requirements are more lenient than the majority of these standards. First, the Agency insists on monitoring of the cathodic protection system within six months of installation. However, six of the seven aforementioned standards suggest monitoring at installation, while API suggests monitoring six to twelve weeks after installation. Second, the Agency is more lenient in its requirements for monitoring during the lifetime of a tank. Five of the seven standards suggest annual monitoring, while the National Standard of Canada suggests monitoring every two years. (Timing of post-installation monitoring requirements were not cited for the seventh standard.) The commenter also notes that the U.S. Department of Transportation supports annual monitoring of the cathodic protection systems used to protect petroleum pipelines in this country.

This commenter (Fiberglass Petroleum Tank & Pipe Institute) also cites papers from several cathodic protection experts who advocate monitoring of cathodic protection systems. One expert stresses that cathodic protection is inexpensive and easy to maintain. Another points out that because no tanks or pipe coatings are perfect, they must be supplemented with cathodic protection. This expert states that without adequate monitoring, cathodic protection may not continue to function. Another expert reports that a maintenance program for a cathodic protection system is necessary because the external tank coating may deteriorate or become damaged.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) noted that the dielectric protective coating on an sti-P3® tank, which is 30 mil thick, is much thinner than the fiberglass coating on a steel-clad tank, and thinner than a fiberglass-reinforced-plastic tank. This commenter argued that cathodic protection devices and a frequent monitoring program are therefore necessary to ensure long term environmental protection when using an sti-P3® tank.

One commenter (Northeast Utilities Service Company) notes that his company conducts monthly tests of the rectifier (the device that powers impressed systems by converting alternating current to direct current) for impressed current cathodic protection systems as well as annual tests of the entire system for impressed and galvanic systems. The commenter's company operates many diverse types of equipment, including approximately 100 UST systems. During the past four years, the commenter has identified approximately 50 cathodic protection problems on all types of equipment, twenty of which were associated with UST systems. The commenter notes that all of the problems were identified during routine monthly or annual inspections, but that these problems would not have been identified under STI's proposal to decrease the monitoring requirement to at time of installation and after disturbance of the UST excavation.

Several commenters (Corrosion Control Specialists, Inc.; Owens-Corning Fiberglass Corporation; NACE International) stated that inspections of the cathodic protection system should be performed annually by a qualified corrosion engineer.

Several commenters (Pump Masters, Inc.; The Coen Company) suggested that, based on their experience with several sti-P3® tanks each, the monitoring interval should be extended. One commenter (Pump Masters, Inc.) suggested that monitoring be performed at 10-year intervals, while another (The Coen Company) suggested monitoring the cathodes every five or 10 years in some soil conditions.

One commenter (Chem Met, Ltd., P.C.) suggested that if the monitoring interval is to be extended, the present schedule should be maintained for the initial five years, and then extended in individual circumstances if experience shows that the system is being properly maintained and monitored.

Another commenter (Beth Anderson) feels that requiring corrosion protection testing every three years for tanks may be excessive, but feels that the requirement for corrosion protection testing of steel piping should not be eliminated. The commenter bases this opinion on her own experience that pipes are often the cause of UST releases, and on the fact that the Tillinghast report did not appear to include a consideration of steel piping.

One commenter (New York State Department of Environmental Conservation) also indicated that if sti-P3® tanks were exempted from the monitoring requirement, all cathodically protected tank and piping systems would have to be given the same exemption. The commenter believes that an exemption for only the sti-P3® tanks would make it difficult to determine which tanks and piping systems required monitoring and which did not.

Several commenters (New York State Department of Environmental Conservation; Letter to David Ziegele from Anonymous) noted that anodes have a finite expected life span. The commenters indicated that the cathodic protection system must be monitored to determine when the useful life of the anode is over so that the system can be upgraded to ensure continued protection of the tank.

One commenter (Metal Products Company) feels that for years tank manufacturers have known how to produce a reliable tank but have chosen not to because consumers would not buy such an expensive tank. The commenter feels that regulations will lead people to buy reliable tanks like the sti-P3® tank.

Response

The Agency does not question the general quality or the short-term integrity of sti-P3® tanks. However, the Agency agrees with commenters who state that the populations of sti-P3® tanks that were included in the Tillinghast report and those used in UST systems throughout the country are relatively young. While many commenters noted that sti-P3® tanks carry a 30-year warranty, because no sti-P3® tanks have yet been in use for 30 years, the Agency takes the warranty as an indicator of predicted, rather than actual,

performance. While corrosion is a complex process and age is not the sole factor in determining a tank's likelihood to fail due to external corrosion, the Agency agrees that age does play a role. The Agency still believes what was stated in the preamble to the proposed UST technical rules, that generally "[i]n order to be effective, these corrosion protection systems must be inspected and maintained. Corrosion protection systems can fail in a number of ways. For example, coatings can deteriorate, wire leads to cathodic protection can break, sacrificial anodes can be consumed, impressed current can be shorted or otherwise fail, adequate potential may not be maintained." See 52 Fed. Reg. 12706 (1987). This reasoning supported the requirement for monitoring in the final technical rules promulgated in 1988, and the new information before the Agency does not lead it to question this finding. The Agency received no compelling data or arguments demonstrating that sti-P3® tank cathodic protection systems can be shown with certainty to remain protected against both short- and long-term corrosion processes if unmonitored, and therefore that regular monitoring of cathodic protection systems is unnecessary.

Regarding the comment cautioning the Agency to get input on the matter from corrosion experts, the Agency agrees that getting such input is wise, and responds that this was one of the reasons for the Notice of Data Availability and request for comments. Input from corrosion experts was received and considered. Many experienced professionals in the corrosion prevention and control community advocate periodic monitoring of cathodic protection systems. In response to the comment arguing that the Agency should consider protection of health and the environment and not protection of one product, the Agency responds that the Notice of Data Availability and request for public comments were intended in large part to gather information to see if the monitoring requirements could be relaxed without diminishing protection of human health and the environment.

While the Agency agrees that any problems with sti-P3® tanks are more likely to emerge after the population has aged several more years, the Agency notes that commenters who stated that sti-P3® tanks will fail in increased numbers in the next few years or about 10 years after installation did not provide data supporting these comments.

The Agency agrees with the commenter who noted that several industry and government standards for cathodic protection monitoring are more stringent than EPA's UST requirements. The Agency also agrees with this commenter that corrosion experts have advocated monitoring of cathodic protection systems.

The Agency agrees with the commenters who suggested that regular monitoring of any UST corrosion protection system, including the sti-P3® cathodic protection system, is a sound engineering practice. The Agency acknowledges the comment noting that the dielectric coating on an sti-P3® tank is typically much thinner than, and different in composition from, the fiberglass in both fiberglass tanks and fiberglass-clad steel tanks. However, this comment, from a fiberglass-centered trade organization, does not provide information on the performance of this coating.

Regarding the comments that monitoring of cathodic protection systems should be performed annually and that it should be done by a qualified corrosion engineer, the Agency notes that its inquiry is limited to STI's request to relax the monitoring

requirements, the Tillinghast report, and the Notice of Data Availability; a request for strengthening requirements is outside the scope of the current discussion. In any event, the Agency disagrees with these comments on two counts. First, the Agency believes that the 3-year interval remains appropriate for the same reasons discussed in the preamble to the final technical rule, which stated, "the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion." See 53 Fed. Reg. 37137 (1988).

Second, the Agency still believes in the soundness of its decision not to require that cathodic protection monitoring be conducted solely by corrosion experts. As discussed in the preamble to the final rule (see 58 Fed. Reg. 37136 (1988)), in response to the Agency's proposal of such a requirement, some "commenters pointed out that the maintenance, operation, and inspection of an installed cathodic protection system could be performed by people who have much less training than a corrosion expert. EPA agrees with these comments, recognizing that most of these inspections are now being conducted by trained specialists." Comments received in response to this Notice of Data Availability present no data or arguments that cause the Agency to question this decision. While the Agency agrees with the Tillinghast report's finding that variability in cathodic protection readings is reduced through the use of better protocols, the Agency believes that requiring that the tester meet the definition of corrosion expert may lead to increased costs without increasing the protection of human health and the environment.

The Agency has examined commonly accepted industry standards for monitoring of cathodic protection systems on underground storage tanks and pipelines. The Agency found that many nationally held standards are more stringent. This lends further support to EPA's decision not to relax the current requirements.

The Agency disagrees with suggestions of monitoring intervals of five or 10 years instead of the current three years; these significantly longer intervals may allow steel tanks whose cathodic protection systems are not functioning properly to suffer external corrosion and leak. The Agency notes that the pace of external corrosion is highly dependent on characteristics of the metal structure and also of the surrounding soil, which vary widely. The Agency also finds the suggestion of extending the monitoring schedule on a case-by-case basis based on past monitoring non-persuasive. This is because of the additional risk of external corrosion should the cathodic protection system not continue to function properly, and also because it would be difficult for owners and operators and for regulatory personnel to keep track of the various individual schedules and to ascertain the compliance status of each tank. Similarly, the Agency agrees with the commenter who believes that an exemption for only sti-P3® tanks, versus all cathodically protected steel tanks, would make it difficult to determine which tanks required monitoring and which did not.

Regarding the comment on cathodic protection monitoring of steel piping, the Agency agrees that pipes are often the source of UST releases, but notes that this is outside the scope of both the Tillinghast report and the Notice of Data Availability.

The Agency agrees that anodes do have finite life spans, and notes that life spans are highly dependent on particular site conditions. The Agency also agrees that the end of anode life is one of the conditions that causes monitoring results to not meet the industry standard for verifying cathodic protection. Appropriate action to determine the cause or causes of such non-compliant results should be taken.

Based in part on the relative youth of the sti-P3® tank population and the stricter requirements of several national standards, the Agency believes that the current requirement for monitoring of sti-P3® cathodic protection systems should not be relaxed.

1.1 Changing the Tank Design Standards and Associated Monitoring Requirements

One commenter (State of Missouri, Department of Natural Resources) feels that rather than defer cathodic protection testing, a more appropriate approach might be to expand the rule to require periodic testing of all types of tanks to ensure continued performance of critical design parameters within specifications on an annual basis. This commenter suggests several requirements, including testing clad USTs to ensure electrical isolation of the inner steel tank from the surrounding soil, periodic diameter measurements of FRP tanks, and periodic testing of the inner coating of FRP products.

Another commenter (ASTSWMO) feels that monitoring other tank systems, in addition to maintaining the current requirements, should be considered.

One commenter (KCL Projects, Ltd.) stated that there is a risk of external corrosion with fiberglass-clad steel tanks. This commenter indicated that fractures occur when tanks are dropped or dented during installation, or from stresses resulting from the differences in the coefficients of thermal expansion between steel and fiberglass. This commenter did not, however, offer a recommendation for additional Agency action with regard to these tanks.

This commenter (KCL Projects Ltd.) also stated that coated tanks approved by Underwriters Laboratory, such as "subject 1746" tanks, have never been required to meet the same strength or corrosion-resistance standards as non-metallic underground tanks, and therefore cannot be assumed to offer the same corrosion protection as non-metallic tanks. This commenter argued that the Agency should require that every new UST meet UL standards for Class 16 tanks (nonmetallic units with secondary containment).

Response

These comments are outside the scope of the Agency's request for comments in the Notice of Data Availability. The Agency explicitly limited its request to the Tillinghast report and to external corrosion on cathodically protected steel tanks.

In any event, the Agency currently does not have sufficient information to support a change in the monitoring requirements for other tank technologies at this time. The Agency does not agree that requiring every new UST to meet UL standards for Class 16

tanks (nonmetallic units with secondary containment) is necessary to guard against releases.

New steel systems with ongoing corrosion protection, including cathodic protection, were allowed in EPA's technical rules because such systems have been shown to provide protection from galvanic corrosion, a major cause of failure in USTs. None of the above comments cause the Agency to question the conclusions in the final technical rules. The Agency believes that proper use and monitoring of cathodic protection systems adequately protects human health and the environment.

1.2 Installation Errors Necessitate Monitoring

1.2.1 General Installation Errors. Several commenters (KCL Projects Ltd.; Owens-Corning Fiberglass Corporation) argued that there is a risk of external corrosion with sti-P3® tanks. They stated that there is no way to locate fractures in the external coating surrounding the steel tank. These fractures occur when tanks are dropped or dented during installation, damaged during shipping, or damaged by improper backfill support or other improper installation methods. Once the external coating has fractured, it can peel away from the steel, exposing the steel to the environment and increasing the likelihood of external corrosion by creating an opportunity for accelerated point corrosion. Therefore, they concluded that the sti-P3® tank design does not provide absolute protection against external corrosion, and that cathodic protection systems should be used and monitoring should be conducted regularly to ensure that the systems are working properly.

One commenter (Owens-Corning Fiberglass Corporation) implied that monitoring of cathodic protection systems should always be required. The commenter noted, however, that if monitoring of the anodes was no longer to be required for sti-P3® tanks, the Agency should consider additional restrictions to ensure that the tank coating is not compromised prior to or during installation. The commenter proposed that the Agency require (1) spark testing at the jobsite to detect damage resulting from manufacturing defects and shipping, (2) the use of "self compacting" gravel backfill that will keep the tank from slumping and cracking, and (3) integrity testing of the coating.

One commenter (STICO [Steel Tank Insurance Company]) states that it knows of five external corrosion failures of sti-P3® tanks, and that the tanks all shared the characteristics of improper installation and a lack of monitoring. STICO believes these failures would have been prevented by proper testing at the time of installation. This commenter believes that, if properly installed and monitored, sti-P3® tanks provide long-term corrosion protection.

Many commenters (International Association of Tank Testing Professionals; New York State Department of Environmental Conservation; ASTSWMO; Corrosion Associates, Inc.; State of Michigan, Department of State Police; Letter to David Ziegele from Anonymous; STICO; Pump Masters Inc.; Charles A. Frey; Brown-Minneapolis Tank; Highland Tank & Manufacturing Company #7; Green Environmental & Corrosion Inc.; Northeast Utilities Service Company) stated that failures of sti-P3® tanks result from improper installation practices that violate the integrity of the cathodic protection system,

and that damage to the cathodic protection system is difficult or impossible to detect at installation. One of these commenters (International Association of Tank Testing Professionals) cited specific examples of compromise to the cathodic protection system, including damage to external dielectric coating materials; failure to remove protective covers from anodes; contacts with piping and other objects during installation; and damage to anodes or insulating bushings. These failures would be detected if proper installation practices and follow-up cathodic protection system monitoring were employed.

One of these commenters (Highland Tank & Manufacturing Company #7) suggested that monitoring at installation would avoid potentially litigious situations in which the installation is complete and the owner must get the installer to correct what is now an expensive problem. Sometimes the hassle of these situations leads the owner to ignore the problem. Two of these commenters (Pump Masters, Inc.; Brown-Minneapolis Tank) suggested that the cathodic protection system be monitored at the time of installation and any time an excavation is disturbed by construction or retrofit activity, and another commenter (Charles A. Frey) suggested monitoring the cathodic protection system within six weeks of installation. One commenter (Corrosion Associated, Inc.) stated that monitoring should be conducted one year after installation.

One of these commenters (Northeast Utilities Service Company) notes that even when installations are performed properly, cathodic protection systems are often damaged during backfilling and post-installation work. The commenter suggests that if the Agency removes the periodic monitoring requirement but requires monitoring after installation, the cathodic protection system should be monitored after (1) backfilling, (2) application of final grade, and (3) installation of all surface structures.

Response

The Agency agrees with commenters who note that problems can result and have resulted from improper installation of sti-P3® tanks. Information from many sources, including the Tillinghast report, indicates that, although documented cases of sti-P3® tank failure due to external corrosion may be infrequent, when such failures occur they can usually be attributed to installation errors. However, again because of the relative youth of sti-P3® tanks, the Agency does not believe that this means that causes of external corrosion other than installation errors are not possible. In addition, while problems due to installation errors may be likely to be revealed soon after installation, if there are problems due to causes materializing after installation, they will come to light later, because the causes occurred later. This, together with the youth of sti-P3® tanks relative to their expected service life, leads the Agency to believe that the fact that most problems to date are from installation errors does not mean that any problems in the future also will be.

The Agency understands that some tank owners or installers perform cathodic protection monitoring at installation. The Agency believes that this is a sound engineering practice that can be of benefit to tank owners and, of course, one that meets the requirements in EPA's regulation that systems be tested within six months of installation. The Agency believes its current requirement to monitor the cathodic protection system within six months of installation is sufficient to detect a lack of cathodic protection before external corrosion causes premature failure. The Agency believes that the reasoning in the

Preamble to the final technical rule, at 53 Fed. Reg. 37137 (1988) remains sound, as it states "the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion."

The Agency believes that cathodic protection monitoring performed at the current frequency is sufficient, and therefore does not need to be enhanced to require monitoring at installation.

1.2.2 **Pre-engineered Cathodic Protection Systems and Installation of Anodes.** Several commenters (Piping and Corrosion Specialties Inc.; Chem Met, Ltd., P.C.) state that a cathodic protection system must be designed for the actual conditions where it will be used in order to function properly. The standard, factory-installed cathodic protection systems furnished by the Steel Tank Institute manufacturers are not designed for specific job conditions. The commenters feel that a standard design will not work in every location where it could be installed. One of these commenters (Chem Met, Ltd., P.C.) feels that a longer monitoring interval may not be acceptable in all such cases.

Another commenter (Corrosion Control Specialist Inc.) stated that he has tested many sti-P3® tanks that have pre-engineered cathodic protection systems. According to this commenter, not one tank has been fully cathodically protected without needing to add anodes to the pre-engineered system. The commenter reports that pre-engineered cathodic protection systems may not meet the specific conditions at a site, such as soil resistivity. The commenter stated that although the sti-P3® tank has an excellent coating system, the failure to monitor for corrosion could eventually lead to a tank failure.

Another commenter (Fiberglass Petroleum Tank & Pipe Institute) notes that the sti-P3® system is manufactured and sold for universal application. The commenter notes that many corrosion engineers advocate a corrosion survey of the tank installation site before the cathodic protection system is installed in order to insure that the proper anode and coating materials will be used. The commenter cites the Underwriters Laboratories standard UL 1746 as evidence that Underwriters Laboratories recognizes that a standard pre-engineered cathodic protection system should not be installed in all soil conditions. The commenter concludes by noting that about half of the soil in the United States is corrosive, having a 4,000 ohm-cm reading, and implies that the standard sti-P3® tank can not successfully work in such soil. Therefore, the commenter feels that the Agency should mandate a six-month monitoring interval for sti-P3® tanks in soil of 4,000 ohm-cm resistivity.

One of these commenters (Piping and Corrosion Specialties Inc.) states that the Steel Tank Institute has never used National Association of Corrosion Engineers recommendations in the design, installation, and testing of their pre-engineered cathodic protection systems. The commenter notes that the life expectancies of cathodic protection systems can vary from a few years to several years. The commenter concludes that periodic testing would be the only way to confirm that the system is operating properly.

One commenter (Owens-Corning Fiberglass Corporation) submitted a report from Harco Technologies showing that sti-P3® tanks built in the last four years are made with zinc anodes, which are weaker than magnesium anodes. The report notes that the zinc anodes are not field tested, and that much of the successful history of the sti-P3® tank is based upon the performance of magnesium anodes in use on older models.

Several commenters (State of Maryland, Maryland Department of the Environment; Piping and Corrosion Specialties Inc.) noted that sti-P3® tanks are generally constructed with anodes made of either zinc or magnesium. These commenters expressed concern that installation sites are rarely checked for soil resistivity, the main factor that determines which type of anode should be used on the tank. The commenters noted that when anodes are installed in an improper environment, they might initially provide protection, but shortly thereafter they may not be useful. The commenters provided the example of a magnesium anode that is installed in an environment with low soil resistivity, an environment in which a zinc anode would be more appropriate. The magnesium anode would be used up rapidly due to self-corrosion, leaving the tank unprotected. The commenters also noted that zinc anodes in an environment with high soil resistivity will only provide adequate protection while the coating surrounding the anode is present. Once the coating breaks down, the anode cannot supply protective current and the tank corrodes. The commenters concluded that cathodic protection testing should be continued to provide a warning when anodes cease to be effective.

One commenter (Corrosion Associates, Inc.) notes that almost all of the tanks that he has observed being installed have been equipped with zinc anodes and backfilled with clean sand or pea gravel, which are high resistivity media. The commenter notes that some of these tanks lose protective potential after a few years, and he believes this is due to passivation of the zinc anode. The cost of excavation to prove that this is the case is prohibitive, so often additional magnesium anodes are drilled in to raise the potential to protective levels. The commenter feels that this is an added expense that would not have been necessary had magnesium anodes been used in the first place.

Response

The Agency agrees that various combinations of site conditions and anode materials exist at sti-P3® installations and at installations of other tanks with factory installed cathodic protection systems. The Agency agrees with those commenters who recommend periodic cathodic protection monitoring as the best way to measure protection against external corrosion at any site regardless of site conditions. The Agency also notes that efforts to determine the proper type of anode to use for particular site conditions, such as pre-installation corrosion surveys, have been performed at sti-P3® installations.

With regard to the commenter who feels that the Agency should mandate a six-month monitoring interval for sti-P3® tanks in soils of a certain resistivity, the Agency notes that requests to increase the stringency of the monitoring requirement are outside the scope of STI's request, the Tillinghast study, and the Notice of Data Availability. In any event, the Agency disagrees with the commenter. The Agency still holds the beliefs found in the Preamble to the final technical rule at 53 Fed. Reg. 37126 (1988), which reads, "EPA continues to believe that use of a single resistivity variable is inadequate to

measure the propensity to corrode." The Agency believes, as stated above, that the three year interval allows sufficient time to take remedial action in order to prevent failure.

The Agency acknowledges that the sti-P3® tank design for cathodic protection is a conservative one, intended to work in a wide variety of conditions. However, the Agency agrees with commenters who report that anodes can be utilized that may not be appropriate for all specific site conditions. In addition, the anode selection and design specifications for factory installed cathodic protection systems that were not manufactured to the sti-P3® specification are not known.

Therefore, the Agency believes that variation in site conditions and the potential for the selection of inappropriate anodes for the cathodic protection system warrant periodic cathodic protection monitoring of sti-P3® tanks. The Agency believes that this requirement is equally appropriate for the less-understood, non-sti-P3® cathodically protected steel tanks as well.

1.3 Changing Site Conditions Necessitate Monitoring

Another commenter (Government of the District of Columbia, Environmental Regulations Administration) noted that anodes corrode in the process of generating protective current. Generally, an adequately designed anode requires no monitoring in the early years of service, provided that the cathodic protection system is checked at installation and there are no structural disturbances during the course of its operation. As the system gets older than 15 years, monitoring is advisable. Another commenter (Electrochemical Devices, Inc.) also noted that where environmental conditions are constant and cathodic protection is maintained, tank potentials will not vary for the life of the anode. This commenter felt that it might be acceptable to relax the frequency of the monitoring requirement, although he felt that in general monitoring was a valuable practice and should be continued.

Several commenters (Xerxes Corporation; NACE International; Northeast Utilities Service Company; New York State Department of Environmental Conservation) argued that changing site conditions justify frequent monitoring. One of these commenters (Xerxes Corporation) states that underground conditions constantly change. Corrosion rates rise and fall as water passes in and out of an area, and the addition of power lines, new buildings and underground piping near a tank location can create disturbances that damage cathodic protection systems. This commenter stated that the typical owner may not be aware of these disturbances, or the damage that they may cause to the corrosion system. The commenter believes that the frequency of the monitoring requirement ensures that any compromise in the protection system will be detected in a timely manner.

Another commenter (NACE International) states that there are some specific reasons to require periodic testing of the cathodic protection system. Those reasons are: (1) changes in UST configuration; (2) electrical changes such as stray current/interference, shorts to other structures, wires cut or damaged, and anodes consumed; (3) environmental changes such as drainage, earthquakes, settlement, and pollution/contamination; and (4) nearby effects such as new construction and utility changes or additions.

One commenter (Northeast Utilities Service Company) notes that operators of facilities do not always inform parties that monitor cathodic protection systems that a tank has been disturbed so that they may initiate testing after the disturbance. Under the current regulatory schedule, problems of this nature are identified during the next cathodic protection monitoring. Without a periodic monitoring requirement, problems caused by disturbances may go unnoticed and lead to possible releases to the environment.

One commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report cites an incident of sti-P3® tank failure as a result of a massive stray current that overpowered the anode. The commenter notes that although the Tillinghast report attributes most corrosion failures to installation damage or excavation disturbances, in this case the report does not mention any excavation disturbance associated with the incident. This commenter concluded that monitoring of the cathodic protection system would have detected the situation so the owner or operator could have taken steps to protect the tank before it corroded and failed.

Response

The Agency believes that the likelihood of changing site conditions surrounding an UST system warrants regular cathodic protection monitoring by the owner or operator. Owners and operators may not be aware of every occasion when the site conditions surrounding an UST, or a group of USTs, have been disturbed. Site conditions, and their effects on an underground structure's corrosion protection, change for many reasons. These include heavy rainfall that can increase soil moisture and therefore the likelihood for external corrosion. Also relevant are nearby construction activities that can disturb the soil, leading to accelerated corrosion due to less homogeneous tank backfill. Construction also can short circuit other metal structures to the tank. In this case, anodes, as they protect more exposed metal, will not last as long as they would otherwise, potentially leading to external corrosion where none would otherwise occur. In addition, electrical changes, such as stray currents from electrical utility lines or changes in nearby impressed current cathodic protection systems, can render a cathodic protection system less effective.

If the owner or operator does not realize that conditions surrounding the USTs have changed, the USTs can become more vulnerable to corrosion and the possibility of a leak. The Agency believes that owners or operators will know when some changes occur, including most construction activity disturbing the backfill, but also believes that there are many opportunities for site conditions to change without the owner or operator realizing the change has taken place. Furthermore, the Agency believes that, without a schedule, some owners and operators will, even if they realize changes have taken place, not properly monitor the cathodic protection system to ensure it is still functioning properly.

Because so many factors that can impact the cathodic protection system are beyond the control of and can occur without the knowledge of UST owners and operators, it is not feasible to rely on owner and operator discretion to determine the appropriate intervals for monitoring a cathodic protection system. The Agency believes that the current monitoring frequency allows owners and operators to detect changes in the UST environment that can compromise cathodic protection systems and to take timely and

appropriate actions to protect those systems. Finally, the Agency believes it would be difficult for implementing agencies to monitor compliance with, and enforce, a requirement to monitor only after site conditions have changed due to construction or another disturbance of the tank excavation.

1.4 Specific Tank Data Provided

1.4.1 **Data on Cathodic Protection Systems.** Several commenters (Owens-Corning Fiberglass Corporation; Fiberglass Petroleum Tank & Pipe Institute) cited a study that was conducted from 1980 to 1983 by the PSG/Hinchman Company for Owens-Corning Fiberglass Corporation. In this study, 76 sti-P3® tanks were tested in four states, and measurements were made relative to the well-established industry standard criterion of a negative potential voltage of at least 0.85 volt (-0.85 volt), as measured between the structure and a saturated copper-copper sulfate half-cell contacting the soil. The Hinchman Company found that although 63 (83%) of the 76 tanks were adequately protected from external corrosion failures, eight (10%) tanks did not meet the selected criterion for cathodic protection because their insulating bushings were shorted, and five (7%) tanks did not meet the selected criterion for cathodic protection for unspecified reasons. These commenters also cited a report (The Geyer Report) that documents the results of surveys conducted by the Steel Tank Institute during 1986. Data from this report indicate that 22%[2] of 591 tanks surveyed and tested did not meet the industry standard -0.85 volt criterion, as required in National Association of Corrosion Engineers' Recommended Practice RP-02-85.

Another commenter (State of Missouri, Department of Natural Resources) reports that it has inspection records for 1,962 USTs. Six of these inspections specifically identified noncompliance with the corrosion protection requirements. Five of these six records covered facilities that are believed, based on registration data, to be sti-P3® USTs. Five of these six records indicate that the initial violation was the owner's or operator's failure to test the cathodic protection system. Three of the six records provide test results indicating that cathodic protection systems were not operating properly.

Another commenter (State of Maryland, Maryland Department of the Environment) noted that several corrosion protection companies that test hundreds of tanks per year across the country report an almost 80% failure rate of cathodic protection systems when checked against the -0.85 volt criterion. (The commenter did not state whether the tanks examined were sti-P3® tanks.) This failure rate implies that most cathodically protected tanks are not adequately protected against corrosion, and that continued monitoring is the only way to detect likely problems with the tanks.

Another commenter (Green Environmental & Corrosion, Inc.) notes that her firm tests a significant number of cathodic protection systems every year. Based on their results, over 60% of sti-P3® systems do not meet the criteria for cathodic protection. One commenter (Letter to David Ziegele from Anonymous) notes that he is aware of single wall sti-P3® tanks originally sold by his company and others that are not cathodically protected and cannot pass a precision test.

Another commenter (Beth Anderson) questions the reliability of sti-P3® tanks that have been in the ground for 20 years or more. The commenter reports seeing significant depletion on some cathodic protection systems (i.e., the anode) after 15 to 20 years of service. The commenter notes that in these instances there was no corrosion damage on the tank, but that the anodes had been replaced to provide better long-term protection. The commenter feels that failure to replace the anodes would have put the tanks at risk of corroding.

One commenter (ASTSWMO) notes that the Tillinghast report says that less than 10% of the Watchdog participants of major oil companies who maintain their corrosion monitoring programs and installed sti-P3® tanks in 1990 reported readings below the -0.85 volt criterion. The commenter expresses concern that these tanks are only three to four years old, and that as many as one in ten are out of compliance with acceptable levels for corrosion protection. The commenter notes that these substandard test levels may be due to factors other than anode failure, but feels that periodic monitoring of the cathodic protection system would indicate the need for further investigation to determine the cause of the substandard readings.

1.4.2 Data on sti-P3® Tanks. Several commenters (Fargo Tank Company; Pump Masters Inc.; Highland Tank & Manufacturing Company # 13, #12, and #10; E.E. Wine Inc.) described their experiences with the removal and inspection of sti-P3® tanks. One of these commenters (Fargo Tank Company) described four sti-P3® tanks that had been in the ground for more than six years. This commenter reported that the four tanks showed no internal or external corrosion, pitting or scratching. Another commenter (Pump Masters, Inc.) described two sti-P3® tanks that had been in the ground for 12 and 14 years respectively. The exterior coatings on the tanks appeared to be in very good condition, with no evidence of peeling or deterioration. Several commenters (Highland Tank & Manufacturing Company #13; Highland Tank & Manufacturing Company #12) described the condition of several sti-P3® tanks removed after seven and ten years in the ground by saying that they looked like the day they were installed. Another commenter (Highland Tank & Manufacturing Company #10) described the condition of an 8,000 gallon, five-year-old sti-P3® tank. The tank had some scratches in its coating and a light gray film covering on the area of the scratches. The commenter said the gray film was the action of the anodes working to protect the scratches and therefore to protect against corrosion. Another commenter (E.E. Wine, Inc.) excavated to the top of an sti-P3® tank that had been buried for seven years, and noted that the tank was in good condition.

Several other commenters (James B. Phillips Company, Inc.; Beaver Petroleum Co. Inc; Crawford Fuel and Oil; Bell Petroleum Ltd., Aviation Products Division; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Thorlup; Benit Fuel Sales & Service Inc.; Highland Tank & Manufacturing Company #8; Alliance Oil Service Company; Baird Petroleum Equipment Corporation; James Islintu) described sti-P3® tanks based on visual observation during removal. Although the commenters did not provide the ages of the tanks, they reported that the tanks showed no evidence of corrosion, and that in some cases original labelling and stencilling were still legible on the external tank surfaces.

Many commenters[3] stated that the sti-P3® tank is an extremely reliable tank. These commenters stated that based on their experience with installing or using sti-P3® tanks, they knew of few or no problems associated with the tanks. These commenters stated that of the more than 200,000 sti-P3® tanks that have been installed, there have been only seven reported failures. One of these commenters (Highland Tank & Manufacturing Company #2) stated that although more than 200,000 sti-P3® tanks have been installed, he only knew of one reported product release from an sti-P3® tank.

One commenter (Brown-Minneapolis Tank) stated that the Tillinghast report mentions only two failures out of the 8,000 sti-P3® tanks included in its sample. The failures of these tanks were due to improper installation and not the tanks themselves.

One commenter (STICO) states that based upon actuarial assessments, the sti-P3® tank has the lowest insurance premium rate as a result of its comparatively low risk exposure -- less than 1/10 of 1% of all sti-P3® tanks fail. He acknowledges that this low risk exposure is due largely to compliance with the cathodic protection monitoring requirement to monitor within six months of installation. He reports that he knows of five external corrosion failures of tanks, and that they all shared characteristics -- improper installation and a lack of monitoring on the part of the owner operator -- which he believes could have been prevented by proper testing at the time of installation. He believes that sti-P3® tanks provide long-term corrosion protection.

Another commenter (Green Environmental & Corrosion, Inc.) notes that the Steel Tank Institute Watchdog Program was finding a large number of non-compliant cathodic protection readings. According to the commenter, this lowered owners' faith in the system, which in turn reduced the number of sti-P3® tanks sold.

Response

In response to concerns about internal corrosion, the Agency points out that the Tillinghast report, like external cathodic protection systems, addresses only external corrosion. In addition, the Agency's information is that internal corrosion of steel tanks historically poses a much smaller risk of release than external corrosion.

The Agency believes that commenters who cited the Geyer Report as indicating that 22% of 591 tanks surveyed and tested did not meet the -0.85 volt criterion misinterpreted the report's findings. Tables 2 and 3 of the Geyer Report show a finding that 10 or 11%, not 22%, of the universe of 591 tanks surveyed were below the -0.85 volt protection criterion.

The Agency notes that the -0.85 volt potential cathodic protection criterion is a conservative one that has been documented over many years as providing protection of steel in a wide variety of conditions. Furthermore, the Agency is aware that site conditions such as extreme backfill dryness, which renders neither the tank nor the anodes cathodically active, can cause non-compliant readings. Therefore, readings more positive than -0.85 volts do not necessarily indicate that a tank is corroding. The Agency notes that several commenters provided data indicating that a significant fraction of cathodic protection monitoring is not able to show that the systems monitored are, with certainty,

meeting industry standards. However, the criterion is a well-established industry standard, and its use is a certain and efficient way to determine that a tank has cathodic protection. When cathodic protection systems do not meet this criterion, owners and operators should investigate the cause of the failure in order to be able to achieve the standard. The Agency believes that the current cathodic protection monitoring requirements of monitoring within six months of installation and at least every three years afterward are adequate and detect potential failures of cathodic protection systems.

In response to comments on sti-P3® tanks, the Agency acknowledges that many experienced professionals believe in their reliability. However, few commenters provided data covering a large number of tanks. These comments do not compel the Agency to reduce the required frequency of cathodic protection monitoring, due largely to a lack of adequate data and to the youth of the population of sti-P3® tanks relative to their expected useful life.

2. Validity of Tillinghast Report

A commenter (State of Michigan, Department of State Police) states that the Tillinghast report is based on a sample that contains a disproportionate number of tanks that were installed after promulgation of the UST rules. This sample, therefore, does not provide sufficient data for identifying the ideal monitoring schedule. The commenter feels that without additional data, there is not adequate evidence to support any change in the monitoring requirements.

Several commenters (Xerxes Corporation; Piping and Corrosion Specialties Inc.) believe that there is no statistically reliable data to either affirm or refute the Steel Tank Institute's assertion that the sti-P3® tank has a very good performance record. One commenter (Xerxes Corporation) notes that much of the information in the report is based on anecdotal information provided by people who are not aware of the limits of their knowledge. To be statistically valid, the survey would need to have a broader population and look at tanks in different soil conditions and of different ages. This commenter also notes that the survey is full of assumptions, uncertainties, and admissions of deficiencies. The other commenter (Piping and Corrosion Specialties Inc.) noted that some of the conclusions in the Tillinghast report are suspect. Specifically, this commenter notes that the report included only 110 owners who had direct knowledge of 385 tanks and secondary knowledge of 2,500 tanks, and 37 installers who had knowledge of 5,000 tanks. The report stated that the cathodic protection requirements are not well understood by many owners, installers and regulators, and that monitoring of the cathodic protection system was generally not being performed. This commenter questions how Tillinghast therefore can conclude that sti-P3® tanks do not need to be monitored when many of those surveyed were not monitoring or did not understand the cathodic protection systems.

Another commenter (Green Environmental & Corrosion, Inc.) contends that the Tillinghast report is not authoritative. The commenter believes that the Tillinghast report is extremely limited for the purpose of rewriting a federal regulation, and that significantly more information should be obtained. The commenter further notes that the owners of the tanks surveyed were under the Steel Tank Institute Watchdog Program, and, because they receive test results under the program, knew the condition of the cathodic protection systems prior to the survey. They would have been informed of the failure of the cathodic protection systems and would have taken preemptive measures to avoid damage to their tanks.

One commenter (Green Environmental & Corrosion, Inc.) stated that the small number of insurance claims against STICO for sti-P3® tank failures is not a valid indicator of the rate of sti-P3® tanks failures. This commenter argued that the numbers would not be valid because many owners would first proceed to their respective state insurance funds for coverage in the event of a failure and because in some cases STICO has refused to honor claims made against it due to what it called contractor negligence.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) says that the Tillinghast report is biased by geographic tank distribution. For example, the sample did

not include any tanks from the midwest (Region 5) and only 1.7% of the tanks selected were located in the northeast (Regions 1 & 2). The majority of the tanks in the sample (50.9%) were located in EPA Regions 6, 7 & 8. The commenter further noted that the geographic areas chosen for the sample are not known to be areas where corrosive soils and stray currents are typically found in UST settings. The commenter argued that a representative sample should have included such states as Ohio where cathodic protection has been problematic due to low soil resistivity and New Jersey where most USTs are installed in urban settings subject to stray currents. In sum, the commenter feels that the Tillinghast report sample selection is biased towards sti-P3® tank locations in the most favorable soil conditions. The commenter notes, however, that even in these favorable settings the Tillinghast report shows an unacceptable level of cathodic protection for many sti-P3® tanks.

This commenter (Fiberglass Petroleum Tank & Pipe Institute) also stated that the Tillinghast contacts were not appropriate because they could only produce anecdotal information. This commenter argues that interviewing installers was inappropriate because it was in the installers' best interest not to identify problems with their installations. The commenter further noted that only 11 of the 37 installers interviewed had experience with sti-P3® tank removals. This commenter also questions the validity of interviews with major oil company representatives. Although not identified in the Tillinghast report, this commenter believes these major oil companies had to be Exxon, Chevron, Shell, Texaco, Mobil and ARCO. This commenter noted that these companies are all FRP tank users and have only incidental experience with sti-P3® tanks. The commenter indicated that while Amoco could also have provided comments, this company has discontinued the use of sti-P3® tanks and therefore the commenter believes that Tillinghast would not have interviewed them for this report. Finally, this commenter noted that the only other company that could have been included is Marathon, which is owned by USX, a steel producer. This commenter argued that Marathon's comments would therefore be biased in favor of sti-P3® tanks.

One commenter (Letter to David Ziegele from Anonymous) feels that the only way to know the truth about sti-P3® tanks is to depose every sti-P3® tank manufacturer under oath and survey every owner of a cathodically protected UST.

Response

The Agency acknowledges the comments regarding the validity of the Tillinghast Report. In its decisionmaking process, the Agency has evaluated and considered the data and information presented in that report and all other information submitted to the docket as of the end of January, 1994, on their own merits.

The Agency notes that the Tillinghast report is the most comprehensive of its kind to date, and includes both "hard" data, such as that from the Steel Tank Insurance Company (STICO), as well as "soft" data, such as estimates from installers and regulators. The Agency agrees with the comment that the report is based on a sample that contains a disproportionate number of tanks that were installed after promulgation of the UST rules in 1988. This may well be because the vast majority of sti-P3® tanks have been installed since 1985, making older sti-P3® tanks and information about them rare. The Agency

further agrees with this commenter that without such data, there is not adequate evidence to support any change in the monitoring frequency requirement. The Agency notes that data of this nature may not be available for several years, due to the youth of installed sti-P3® tanks relative to their expected service life and relative to their current warranty period of 30 years. Even though age is by no means the sole indicator of tank integrity, corrosion is progressive and the Agency believes that the fact that relatively few older tanks were surveyed skews the applicability of the report's findings to the subject of STI's request.

The Agency acknowledges the report's findings that there have been very few recorded failures of sti-P3® tanks, but acknowledges the commenters who stated that no statistically reliable data was included to affirm the claim that the sti-P3® tank has a very good performance record to date. The Agency again notes the lack of data from older sti-P3® tanks.

The Agency agrees with the comment noting that much of the information in the report is anecdotal, and that many of the people providing the information appear to have little technical knowledge of cathodic protection. The Agency believes that the findings obtained from these sources are therefore less persuasive than if respondents demonstrated a high level of technical competence. The Agency agrees with the comment that the report does have definite limitations, some of which are stated in the report itself. For example, the report notes that the actual numbers of tanks owned or installed by survey participants could be 50% higher or lower; thus, Tillinghast rightfully could not state with reasonable certainty that all instances of external corrosion of sti-P3® tanks were identified, and also could not state with certainty that the instances that were identified involved sti-P3® tanks.

The Agency also agrees with one commenter that the report noted that cathodic protection monitoring is frequently not performed, and therefore any conclusion that sti-P3® tanks do not need to be monitored is questionable. Furthermore, the Agency agrees with this commenter that the tank owners surveyed in the Tillinghast report that were covered by STI's Watchdog program are more likely to know the condition of their cathodic protection systems and to have taken remedial steps in the event of noncompliant readings. Finally, EPA believes that this commenter's assertion that the number of claims against STICO is not a valid indicator of sti-P3® failures is plausible, partly because a large majority of states have funds available for addressing leaks. The Agency cannot speak to the comment regarding honoring claims and alleged contractor negligence.

The Agency acknowledges one commenter's claim of geographical bias, and agrees with this commenter that the Tillinghast report shows that several percent of sti-P3® tanks tested are not shown to meet industry standards for cathodic protection. Regarding the interviews of installers, the Agency agrees with this commenter that the report shows only 11 out of 37 installers interviewed had experience with sti-P3® removals, and believes that information on tank condition at removal is very important with regard to external corrosion.

The Agency agrees with commenters that some of the sources of information in the Tillinghast report are not financially independent of the success of sti-P3® tanks, but also

notes that this is true of several of the commenters. The Agency has taken into consideration the apparent interests of those providing information as appropriate.

In response to the anonymous commenter who felt that the only way to know the truth about sti-P3® tanks was to depose all sti-P3® manufacturers under oath and survey all owners of cathodically protected tanks, the Agency believes that such activities would be very resource intensive and impractical. However, the Agency acknowledges that the more respondents are surveyed, the greater the level of confidence in the responses, and notes that the Tillinghast findings are based on surveys of only a small fraction of the installed sti-P3® tanks.

The Agency acknowledges the report's findings that almost eight percent of tanks in the Watchdog program in recent years were not shown to be protected for one reason or another, though cathodic protection monitoring results are reported to be improving. The Agency also acknowledges the report's finding that, unless a tank is in the Watchdog program or maintained by a major oil company, cathodic protection monitoring is generally not being performed. The Agency also acknowledges that assessing the frequency of cathodic protection testing was not the primary purpose of the report, and that Tillinghast states that it did not obtain enough corrosion monitoring data to statistically determine an optimum monitoring frequency.

Consideration of the Tillinghast report and comments regarding it lead the Agency to believe that routine cathodic protection monitoring is necessary in determining whether or not steel tanks are protected from external corrosion, and should still be required.

3. Inequality of Rules - Applicability to Other Tanks

Several commenters (Highland Tank & Manufacturing Company #2, Ten Hoeve Brothers, Inc. #1) argue that the monitoring requirement is inappropriate because it is not placed on bare steel tanks and other technologies that are allegedly less proven than the sti-P3® tank.

Several commenters (Xerxes Corporation; Marcel Moreau Associates; State of Michigan, Department of State Police) argue that the cathodic protection monitoring requirement is not inconsistent with the phase-in schedule for existing UST systems. One of these commenters (Marcel Moreau Associates) states that the fact that sti-P3® tanks require cathodic protection monitoring and others do not should not be viewed as unfair. Rather, the fact that different requirements apply to different tanks should be accepted as part of the overall regulatory strategy used to ensure the safety of all UST systems by 1998. The commenter adds that sti-P3® tank distributors could use this argument as a selling point, promoting their tanks as better protected from leaks than are brands that do not have to adhere to the monitoring requirements. Another of these commenters (State of Michigan, Department of State Police) notes that the cathodic protection requirement for steel tanks is not indicative of a bias toward unprotected steel tanks. Rather, the 1998 phase-in of tank upgrade requirements is intended to minimize the financial burden on the regulated community for costs associated with upgrading UST systems. The other commenter (Xerxes Corporation) stated that although the requirements appear to be inequitable with older non-protected tanks, the commenter argues that the customer is paying for a better product when he buys a cathodically protected steel tank.

Several commenters (Xerxes Corporation; Marcel Moreau Associates; State of Michigan, Department of State Police) argue that because periodic monitoring of fiberglass tank diameters is not required is not a valid reason for eliminating the cathodic protection monitoring requirement for steel tanks. The commenters contend that the two types of tanks fail in different ways. Thus, requirements that may be appropriate for steel tanks may not be appropriate for fiberglass tanks. Another commenter (State of Michigan, Department of State Police) argues that, although the absence of tank deflection monitoring requirements for fiberglass-reinforced-plastic tanks supports a lack of tank deflection monitoring requirements for steel tanks, the absence of such a requirement does not justify eliminating the cathodic protection monitoring requirements for steel tanks.

Response

While it is true that cathodic protection monitoring is not required on bare steel tanks prior to December 22, 1998, this fact does not warrant relaxation of the requirements for cathodically protected steel tanks. The Agency believes that the discrepancy in requirements is appropriate. It would have been most environmentally protective to require immediate upgrading of bare steel tanks. However, the Agency still supports its original decision, made when the technical rule was promulgated in 1988, to allow owners of bare steel tanks until 1998 to meet these requirements. This decision was based on the Agency's conclusion that a shorter compliance period was not feasible, given the diverse nature and large size of the regulated UST community. Because periodic

cathodic protection monitoring of steel tanks that do not even have cathodic protection serves no purpose, and because, as stated elsewhere, cathodic protection monitoring is neither difficult nor expensive, the Agency believes that applying different standards is reasonable. Meanwhile, it is important for cathodically protected tanks to be monitored, to ensure that they are indeed protected, and to ensure that they do not add to the threat posed by existing bare steel tanks. The Agency also notes that bare steel tanks must be replaced or upgraded by December 22, 1998. Either of these tasks costs thousands of dollars. By contrast, tanks with pre-engineered cathodic protection monitoring systems (and spill and overfill equipment) need not be upgraded or replaced.

Although the Agency defined a ten year compliance period for upgrading existing bare steel tank systems, it continues to be concerned about their potential impact on human health and the environment. The Agency notes that it and many state UST programs have encouraged owners and operators to upgrade their existing tank systems before the 1998 deadline and have seen some progress toward that end. Compliance with the monitoring requirements for those upgraded or replaced systems has greatly reduced the incidence of corrosion failure in steel tanks. Given the complex nature and size of the regulated community, the Agency believes that this combination of requirements has provided the greatest protection of human health and the environment.

In response to concerns about the inequality of the rule because it does not apply to fiberglass tanks, the Agency believes that tank wall deflection in fiberglass tanks is a fundamentally different physical phenomenon than external corrosion of steel tanks, both in its nature and in its likelihood to pose a threat to tank integrity over the long term. The materials used to construct different types of tanks vary and the Agency, in the technical standards promulgated in 1988, initially determined specific testing methods and frequency based on the risk posed by those materials. The Agency concedes that coated, cathodically protected steel tanks meeting the UST regulations pose orders of magnitude less risk of failure due to external corrosion than unprotected steel tanks. Nevertheless, the fact remains that steel, if its protection is compromised, is subject to long-term progressive deterioration by way of corrosion in a way that fiberglass-reinforced plastic is not. In the preamble to the proposed technical rule, The Agency noted that corrosion was the major cause of leaks from unprotected steel UST systems. See 52 Fed. Reg. 12666 (1987). The Agency believes that monitoring cathodic protection systems is necessary to ensure that cathodically protected steel systems remain protected, and that they do not in the future pose risks to human health and the environment similar to those the Agency found in the past. In addition, the Agency currently does not have information indicating that fiberglass tanks pose particular risks of failure over the long term or that imposing periodic monitoring of fiberglass tanks, such as deflection monitoring, would reduce risks to human health and the environment. Therefore, the Agency agrees with commenters who argued that the lack of monitoring of deflection in fiberglass tanks is not a valid reason to eliminate or reduce the monitoring requirement on steel tanks.

4. Duplication of Leak Detection Requirements

Several commenters[4] indicated that when properly used or installed, inventory control techniques and leak detection monitors provide notice of tank system failure and effectively reduce chances for spills of any consequence. These commenters stated that the cathodic protection monitoring requirement is redundant in light of these other requirements.

Several commenters (ASTSWMO; Marcel Moreau Associates; NACE International; State of Michigan, Department of State Police; Green Environmental & Corrosion, Inc.; State of Missouri, Department of Natural Resources), however, noted that leak detection monitoring and cathodic protection monitoring do not serve the same purpose. Leak detection monitoring provides notice of releases and environmental damage. Cathodic protection monitoring works as a means of leak prevention by providing notice of potential corrosion which could lead to leaks. These commenters, therefore, disagreed that the two systems are redundant, and argued that leak detection monitoring does not supersede the need for cathodic protection monitoring.

One of these commenters (ASTSWMO) noted that more resources are currently directed toward clean-up than to preventive measures. However, the commenter feels that the Agency's approach to the problem of leaking USTs is essentially correct as it addresses both ends of the tank problem -- using resources as needed to respond to leaks while developing requirements that focus on prevention.

Response

The Agency believes the current cathodic protection system monitoring requirements do not duplicate the leak detection requirements. Leak detection systems are designed to inform owners and operators when a leak in the UST system has already occurred. By contrast, cathodic protection systems are designed to prevent damage to USTs by warning owners and operators that their UST system or piping is no longer adequately protected and has become vulnerable to corrosion. Cathodic protection systems and the requirements for monitoring them are designed to reduce the likelihood that any release will occur and to prevent pollution; leak detection systems help to reduce the likelihood that a leak from an UST system will become significant, but are not designed to reduce the likelihood of a leak.

5. Ease and Costs of Compliance

5.1 Ease of Cathodic Protection Monitoring

One commenter (New York State Department of Environmental Conservation) indicated that it is easy to monitor cathodic protection systems. The commenter noted that once a system has been properly installed that provides access to the soil above the tank, the major problem to be expected is low soil moisture content. This condition can lead to incorrect or incomplete readings. The commenter suggested that this could be corrected by adding water to the soil and taking the reading again.

Another commenter (State of Missouri, Department of Natural Resources) noted that the problem with the current monitoring requirement is that the specified frequency differs from the frequency of other actions required under UST rules. This makes the requirement difficult to remember. Another commenter (Chem Met, Ltd., P.C.) notes that often there is a tendency to forget to monitor the cathodic protection system. The commenter feels that this tendency will become more prevalent if the monitoring schedule is extended.

Another commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report states that many owners and installers do not understand the technical basis for cathodic protection. The commenter responded that a lack of education should not be a reason for eliminating the monitoring requirement. The commenter proposed that more education is needed to help people understand why tanks are protected and how to determine if protection is adequate. One commenter (Xerxes Corporation) notes that the Tillinghast report mentions the need for additional training for installers and customers.

A commenter (Piping and Corrosion Specialties Inc.) states that incorrect testing procedures could lead to inaccurate readings when the cathodic protection system is being monitored. The commenter worries that inaccurate readings may be obtained because the Steel Tank Institute does not have a technical report form which specifies the required location of the test electrode so that it will be in a proper location to avoid direct influence of the anodes on the test reading.

5.2 Cost of Cathodic Protection Testing

One commenter (Fargo Tank Company) noted that tank owners must hire a testing agency at extra cost to test the cathodic protection system, an unnecessarily expensive burden.

Several commenters (Cayuga Onondaga, Board of Cooperative Services; Owens-Corning Fiberglass Corporation; Green Environmental & Corrosion, Inc.) disagreed and stated that the actual costs of testing are minimal. One commenter (Cayuga Onondaga, Board of Cooperative Services) indicated that the cost of testing is approximately $95 per year. This commenter indicated that commercially available hand-held test meters cost $150-$200. The commenter noted that the time required to test either tank or piping is

less than five minutes if test leads are available, 10-15 minutes each if a test probe or wire must be touched to the bottom of the tank. The commenter assumed that the cost for a laborer to inspect the tanks would be $20 per hour. The commenter thus calculated a cost of $95 per year for annual testing of a six-tank facility.

Another commenter (Owens-Corning Fiberglass Corporation) cited a report entitled "UST System Installation and Maintenance" by Wayne B. Geyer. The report notes that testing can be done with a simple and inexpensive voltmeter and requires only five minutes every three years.

Another commenter (Green Environmental & Corrosion, Inc.) reports that her firm tests over 300 sti-P3® tank sites per year. Her firm charges $200 per location, but has charged as little as $150 per location for clients with multiple sites. The commenter is aware of other firms that charge as little as $95 per location, which translates into an annual cost of $32 to $67 per location.

Another commenter (Northeast Utilities Service Company) states that the annual cost of cathodic protection monitoring is between $130 and $500. The commenter further states that in the past four years his company has experienced 27 releases, costing a total of over $4 million, an average of $150,000 per release. The commenter concludes that the cost/benefits analysis suggests that cathodic protection monitoring should be retained in some form. Two other commenters (Piping & Corrosion Specialties Inc.; ASTSWMO) report that the current monitoring requirement is a very inexpensive and cost-effective policy to prevent tank leaks and the high cost of remediating those leaks.

5.3 Costs of Cathodic Protection Monitoring Systems Affects Consumer Choices

One commenter (Brown-Minneapolis Tank) states that it will cost the industry billions of dollars to monitor sti-P3® tanks. Furthermore, the cost of monitoring an sti-P3® tank places this technology at an unfair disadvantage with other technologies that do not have a monitoring requirement, some of which have higher failure rates than sti-P3® tanks.[5]

Several commenters[6] indicate that when they inform their customers of the monitoring requirement for sti-P3® tanks, the customers choose other tanks -- including those that use experimental technologies with unproven track records -- because they do not want the burden of complying with the monitoring requirement. One commenter (Highland Tank & Manufacturing Company #3) reported that in order to remain competitive, his company is being forced to sell products without the proven cathodic protection system, a technology that most customers would prefer to have but are unwilling to purchase because of the monitoring requirement.

Another commenter (Highland Tank & Manufacturing Company #7) states that the regulations hurt sales of sti-P3® tanks because competitors have waged a marketing campaign stressing concern about the safety of sti-P3® tanks and implying that such concerns do not exist for the competition's tank. The commenter states that competitors use scare tactics to dissuade consumers from buying sti-P3® tanks. Competitors emphasize that the sti-P3® tank requires periodic monitoring and that if the monitoring is

not performed and records are not kept, the owner can be fined $10,000 a day. These claims put the sti-P3® tank at a competitive disadvantage.

One commenter (Letter to David Ziegele from Anonymous) notes the steel tank industry is currently under great pressure to be profitable as well as competitive. The commenter reports that privately, many companies oppose eliminating the monitoring requirement for single-walled steel tanks. While some companies do not want to manufacture single-walled USTs for reasons of liability, the commenter feels that companies will be forced to manufacture such products in order to remain competitive should the monitoring requirement be rescinded.

One commenter (Xerxes Corporation) states that, based on experience, sti-P3® tanks, particularly single wall versions, are priced competitively with other tanks. The commenter indicates that the added cost of the monitoring requirement does not make sti-P3® tanks uncompetitive with competing brands.

Another commenter (State of Michigan, Department of State Police) notes that the Tillinghast report indicates that owners are choosing aboveground tanks. This contradicts the Steel Tank Institute's claim that owners are choosing other underground systems because they feel that the monitoring requirement is a nuisance.

Another commenter (Marcel Moreau Associates) notes that if consumers consider monitoring to be a nuisance and choose other tanks it is simply a fact of life in a capitalist economy that should not be used as a justification for eliminating the monitoring requirement. The commenter strongly expresses his opinion that monitoring is a standard practice for a tank with a cathodic protection system. If a consumer wants to have a tank with a cathodic protection system, it is reasonable to require that the system be operated properly. This commenter also acknowledges that monitoring the cathodic protection system costs money, but states that the practice is essential to the proper operation of an sti-P3® tank. He argues that if one cannot afford to operate an sti-P3® tank in the manner that it should be operated, one should consider using a different technology. He states that if the Steel Tank Institute thinks that the cost of monitoring is causing the sti-P3® tank to be viewed as a non-viable technology in today's marketplace, it is the result of the natural workings of the free market.

One commenter (Xerxes Corporation) feels that the fact that the monitoring requirement is affecting buyers' choices is not a special case. The commenter implies that every tank has characteristics which buyers like or dislike, and their choices will be affected by those consumer tastes and the availability of other products on the market.

Another commenter (Green Environmental & Corrosion, Inc.) contends that when considering whether to modify the current monitoring requirement, the opinions of the engineering community should far outweigh that of an economically affected provider. The commenter reports that the claims made by Steel Tank Institute are based on economics rather than on engineering principles.

Response

The Agency agrees with commenters who stated that cathodic protection monitoring is easy to perform and relatively inexpensive. Problems commonly reported with monitoring, such as incorrect readings caused by low soil moisture content, often can be rectified by relatively simple means, such as adding water to the soil and taking the reading again. The Agency agrees with the commenter who stated that a lack of understanding of cathodic protection on the part of owners and installers should not be a reason for eliminating the monitoring requirement, and, instead, better understanding is what is needed. The Agency acknowledges the comment that the Tillinghast report mentions the need for more training for UST installers and operators. The Agency acknowledges the comment that incorrect testing procedures could lead to inaccurate cathodic protection readings. However, the Agency believes that the UST regulatory requirements for testing act to ensure that incorrect testing does not pose undue risks. For example, the fact that monitoring must be repeated periodically reduces the risk that a single inaccurate reading may be relied on for many years. The comments overall support the conclusion, also expressed in a report by STI, that the cost of monitoring is minimal and that it is easy.

Other commenters provided data showing that cathodic protection monitoring is relatively inexpensive, ranging from $95 to $200 per typical location with three USTs. The monitoring is inexpensive relative to many other expenses involved in installing and operating USTs. The Agency understands that a typical three-tank retail fuel marketing facility costs over $100,000 to construct. In addition, the monitoring is inexpensive in terms of both time and money relative to the costs to both the private and public sector of the consequences of a leak, which could result from several causes, including insufficient tank corrosion protection. There have been over 250,000 confirmed releases; sites with only soil contamination often cost tens of thousands of dollars to address; remediation of contaminated groundwater sites typically cost over $100,000. The Agency believes that the costs of monitoring are reasonable and do not place an unnecessary financial burden on owners and operators.

In response to concerns that the costs of cathodic protection monitoring affect consumer choices, the Agency acknowledges that this argument may be plausible, but believes it is one of several factors that have lead to changes in the market shares for various tank technologies over the past few years. In response to the commenters who indicated that customers sometimes choose other technologies without proven track records to avoid the monitoring burden, the Agency believes that all the technologies allowed in the final technical rule (40 CFR 280.20) are protective of human health and the environment. These technologies include corrosion protected steel, fiberglass-reinforced plastic, steel clad with fiberglass-reinforced plastic, and, for sites meeting certain requirements, steel without additional corrosion protection.

6. Failure to Enforce the Cathodic Protection Monitoring Requirement Is Not a Justification to Relax the Frequency of the Requirement

One commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report states that enforcement of the monitoring requirement is not a high priority with federal and state inspectors. The commenter argues that the current lack of enforcement of the monitoring requirement does not reduce the need for monitoring. The commenter states that if in the future leaks are detected from USTs because the tanks did not remain corrosion resistant, the issue of compliance with the cathodic protection monitoring requirements will become much more important.

Another commenter (Marcel Moreau Associates) notes that corrosion protection enforcement has not been a priority in many states because resources are being applied to more immediate problems such as leaks and existing contamination. The commenter has noticed great interest in corrosion protection among state regulatory personnel. The commenter notes that he has conducted or is scheduled to conduct corrosion protection training for regulatory personnel in thirteen states.

Another commenter (State of Michigan, Department of State Police) notes that the Steel Tank Institute reports that since enforcement efforts are directed at cleanup and leak detection, cathodic protection monitoring is not an essential activity in the UST program. This commenter responds that states determine program priorities based on a variety of factors, and that these priorities are not necessarily an indication of the overall value of cathodic protection monitoring. Another commenter (Xerxes Corporation) indicates that although the cathodic protection monitoring requirement is not being enforced, it is still considered a priority. The commenter suggests that enforcement of the requirement will occur after 1998, the regulatory deadline for all tanks to be corrosion protected.

6.1 Enforcement of the Monitoring Requirement Would Enhance Owners' and Operators' Ability to Comply with the Requirement

One commenter (Cayuga/Onondaga Board of Cooperative Services) observed poor compliance with the cathodic protection monitoring requirement. This commenter, with more than eight years of experience in tank testing and installation involving nearly 100 sti-P3® tanks, specifically noted that the required cathodic protection testing data was on file with owners and operators in only about 2-3% of the cases with which he had been involved. Data were not available for a variety of reasons. Steel piping was inaccessible, lacked protective cathodic coatings, or did not have anodes attached. Some tanks had anodes that were still covered by plastic coverings on inspection following installation. The commenter also noted that fewer than 50% of the tank installations he observed provided test leads accessible for test metering. The commenter concludes that since there is a small number of accessible, cathodically protected piping installations, the cathodic protection monitoring regulations, both state and federal, appear unfeasible.

Response

While the Agency acknowledges that enforcement priorities may vary among states, the extent of current enforcement activity does not determine the need for the frequency of monitoring cathodic protection systems. The Agency believes that cathodic protection monitoring is an important component of prevention activities for UST owners and operators. Cathodic protection monitoring is important because it is a relatively inexpensive preventive measure owners and operators can take to ensure they do not have equipment susceptible to external corrosion and the resulting product loss. The Agency also notes that the UST regulations require less frequent cathodic protection monitoring than do other federal regulations promulgated by EPA (40 CFR 264.195) and the Department of Transportation (49 CFR 192.455 to 192.477, Appendix D). The Agency does not believe the UST monitoring requirements are unnecessarily burdensome.

The Agency acknowledges that in many states, enforcement of the leak detection requirements have been given priority over cathodic protection monitoring requirements because of the earlier leak detection compliance deadlines. However, the Agency agrees with the comment that, with the upcoming 1998 compliance deadline for corrosion protection of all regulated USTs, emphasis will most likely shift to include more vigorous enforcement of the cathodic protection monitoring requirements. This is because compliance with the 1998 deadline is very important in protecting the environment, and because enforcement can be more straightforward and uniform at that time, since there will be no question as to whether an UST must meet the requirements.

In response to the commenter who stated that since there are many tanks without test leads accessible for testing, the Agency notes that, while test leads make monitoring easier, they are not necessary for testers to make the needed electrical contacts.

7. Miscellaneous Issues

One commenter (KCL Projects Ltd.) expressed concern that the sti-P3® system has no means of protection against internal corrosion. This commenter suggested that the Agency ask Tillinghast to provide data relating to the effectiveness of the sti-P3® tank at preventing leaks due to internal corrosion.

One commenter (Fond du Lac County, Office of the County Highway Commission) misunderstood the solicitation for comments, and argued that the Agency should not impose stricter standards on sti-P3® tanks by requiring that those tanks be removed and upgraded with new cathodic protection devices.

One commenter (Corrosion Control Specialist, Inc.) stated that the Agency and NACE need to clarify that the qualifications for a corrosion engineer which are stated in 40 CFR Section 280.12 should not be interpreted too liberally. Specifically, clarification should focus on distinguishing between the different levels of NACE certifications.

Another commenter (AT&T) states that the Agency needs to formalize it's position regarding cathodic protection testing of double wall USTs, and that the position be included in any amendments to the cathodic protection requirements of the UST regulations. The commenter says that currently the Agency's position is that the UST regulations do not require testing of double wall steel USTs, but that state and local regulatory agencies that promulgate and enforce UST regulations may not be aware of the Agency's position. This position was delineated in a letter dated July 18, 1991 from David O'Brien of the Agency to Charles A. Frey of Highland Tank & Manufacturing Company. The commenter states that the RCRA Hotline and OUST refer to this letter as a statement of the Agency's position.

One commenter (Fiberglass Petroleum Tank & Piping Institute) states that sti-P3® tanks do not qualify to be sold under the Underwriters Laboratories label. The commenter notes that the Steel Tank Institute alludes to compliance with the UL standard in their advertisements because they say, "built to nationally recognized Steel Tank Institute and Underwriters Laboratories standards." This commenter asks the Agency to recognize that the Steel Tank Institute advertisements, despite their reference to UL, should not be assumed to convey approval of the sti-P3® tank by Underwriters Laboratory.

Response

In general, the Agency acknowledges these comments but does not believe they are directly relevant to the issues addressed by the Notice of Data Availability, nor do they provide specific data that can be used in evaluating the appropriateness of the current cathodic protection monitoring requirement. The Agency, however, appreciates these comments and has given them due consideration in its decisionmaking process.

In response to the comment regarding internal corrosion, the Agency notes that its current inquiry is limited to STI's request to relax the monitoring requirements, the Tillinghast report, and the Notice of Data Availability, which all focus on external

corrosion. In any event, the Agency's information is that internal corrosion of steel tanks historically poses a much smaller risk of release than does external corrosion.

The comment concerning removal of sti-P3® tanks is not relevant because cathodic protection monitoring applies only to installed tanks. The cathodic protection requirement has no direct relation to tank removal.

The comment regarding the UST regulations, corrosion engineer qualifications, and NACE International certification levels is not within the scope of STI's request to relax the monitoring requirements, the Tillinghast report, or the Notice of Data Availability. In any event, the Agency is reviewing these subjects in a separate activity and acknowledges this comment.

The Agency acknowledges the comment regarding cathodic protection monitoring of double wall cathodically protected steel USTs. However, the Agency's Notice of Data Availability spoke to single wall cathodically protected tanks, and the Agency believes it is this type of tank which is most crucial to monitor for cathodic protection.

In response to the comment about the compliance of sti-P3® tanks with Underwriters Laboratories (UL) standards and about STI advertisements, the Agency notes that this comment is not within the scope of the current discussion. Instead, this is a matter more appropriately pursued with STI and/or with UL.

ENDNOTES

1. John W. Kennedy Company, Inc. #1; JEMKO Petroleum Equipment, Inc.; Oil Equipment Sales, Inc.; Northeast Mechanical Corporation; EnviroReps, Inc.; Advanced Pollution Control; Parker & Associates, Inc.; Fedco Tank and Equipment, Inc.; John W. Kennedy Company, Inc. #2; Pet-Chem Equipment Corp.; Gould Equipment Company; Whitelock and Woerth, Inc., Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Quality Petroleum Systems, Inc.; Hirri Service Company; Professional Petroleum Service Company; TJ Equipment Company; James B. Phillips Company, Inc.; Trombold Equipment Company; Young Equipment Division; D.T. O'Connor, Inc.; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; NECO Equipment Company; Allan U. Bevier, Inc.; Tate Instrumentation & Controls

2. These commenters misinterpreted the total failure rate provided for the 591 tanks in the Geyer Report. The actual failure rate cited in the Geyer Report is 10%.

3. Highland Tank & Manufacturing Company #1; Highland Tank & Manufacturing Company #2; Luther P. Miller, Inc.; Toot-N-Scoot: A Division of Best Oil Inc.; Boulder Oil Company; Dean Fowler Oil Company; Lou Korchak Oil Company, Inc.; John W. Kennedy Company, Inc. #1; Emmart Oil Company; Enercon Services, Inc.; Highland Tank & Manufacturing Company #3; Midstate Fuel Storage Systems; Interface Services, Inc. #1; Alaskan Oil; Clemett & Company; Interface Services, Inc. #2; JEMKO Petroleum Equipment, Inc.; Earl "Jerry" Galvin Manufacturers Representative; Environmental & Energy Systems Company #1; Carlucci Construction Company, Inc.; Environmental & Energy Systems Company #2; Oil Equipment Sales, Inc.; Fedco Manufacturing Corporation; JABE Construction & Equipment Inc.; Barkman Oil Company Inc.; Environmental & Energy Systems Company #3; Miller's Petroleum Systems, Inc.; Tiger Fuel Company; H.J. Tanner, Inc.; Northeast Mechanical Corporation; Glider Oil Company; EnviroReps, Inc.; HOBBS Inc. #1; Advanced Pollution Control; HOBBS Inc. #2; Parker & Associates, Inc.; Fedco Petroleum Installations, Inc.; Kelley Omega, Inc.; Fedco Tank and Equipment, Inc.; Center Point Tank Services, Inc.; C & S Contractors & Equipment, Inc.; Mon Valley Petroleum Company; Northrup Supply Corp.; Environmental & Energy Systems Company #4; J & J Marts, Inc., Mountaineer Mart; Gary Dyer Excavating Company, Inc.; Purvis Brothers, Inc.; Everybody's Oil Corporation; Alaskan Oil Inc.; International Association of Tank Testing Professionals; Coldiron Fuel, Inc.; Griffith Oil Company; C. Arlo Cummins; John W. Kennedy Company, Inc. #2; Bettiol Fuel Service, Inc.; Ravenna Oil Company; Pet-Chem Equipment Corp.; Leake Oil Company; Cuyahoga Landmark Petroleum Services; Varouh Oil, Inc.; The Lyden Company; Cross Oil Corporation; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; M&M Oil Company, Inc.; The Coen Company; Petroleum Equipment Services, Inc.; James A. Grogey; Worth & Company, Inc.; A. Graziani & Company, Inc.; Highland Tank & Manufacturing Company #5; Whitelock and Woerth, Inc.; McKenzie Group, Inc.; Voegele Mechanical, Inc.; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Joseph Stong, Inc.; Quality Petroleum Systems, Inc.; Beck Suppliers, Inc; Lechmanik, Inc.; Ward's Pump and Tank; Edward J. Meloney, Inc.; Valley

Equipment Company, Inc. #1; Grace Oil Company; Republic Oil Company, Inc.; Valley Equipment Company, Inc. #2; Humb Remodeling & Equipment; Jack Hirsch; Hirri Service Company; Black Equipment, Inc.; Professional Petroleum Service Company; TJ Equipment Company; James B. Phillips Company, Inc.; United Environmental Group Inc.; Fedco Tank & Equipment, Inc.; Cernak Tank Company, Inc.; United Marketing, United Refining Company of Pennsylvania; Petro Tech Electronics Inc.; Trombold Equipment Company; G.E. Sell, Inc.; Steven J. Tornabine; Crawford Fuel & Oil; Holmes Oil Company; Young Equipment Division; Marshall Farms, Inc.; M&E Anderson Equipment & Testing; Laurel Valley Oil Company; E.E. Wine, Inc.; Rice Christ, Inc. #1; Rice Christ, Inc. #2; Rice Christ, Inc. #3; Eastern Petroleum Services, Inc.; Ullman Oil, Inc.; Carl Mundy Contractors #1; James Nichols; Tri-State Petroleum Corporation #1; Petroleum Services, Inc.; Ten Hoeve Brothers, Inc. #1; Carl Mundy Contractors #2; Kay Bibih; Tess Bechtold; D.T. O'Connor, Inc.; Penzoil Products Company; Carl Mundy Contractors #3; Joe DeFazio Oil Company; Childers Oil Company; J.H. Crosier Company; Bell Petroleum Ltd., Aviation Products Division #1; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Throlup; Benit Fuel Sales & Service Inc. #1; Highland Tank & Manufacturing Company #6; Benit Fuel Sales & Service Inc. #2; Bell Petroleum Ltd., Aviation Products Division #2; Highland Tank & Manufacturing Company #7; Herman Goldner Company, Inc.; A.C. & T. Company, Inc.; Caledonia Oil Company #1; Caledonia Oil Company #2; Mountain State Bit Service, Inc.; SICO Company; Caledonia Oil Company #3; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #8; Highland Tank & Manufacturing Company #9; Alliance Oil Service Company; Cortland Pump & Equipment Company; Bedford Valley Petroleum Corporation; Coastal Pump & Tank, Inc.; First State Petroleum Services, Inc. #1; Willison Oil, Inc.; Petroleum Industry Consultants, Inc.; Tri-State Petroleum Corporation #2; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Lane & Clark Mechanical Contractors, Inc.; Craig K. William; Joseph Goffrey; Oil Equipment Sales & Service Company, Inc. (OESSCO); APCON Environmental Services, Inc.; Franklin Oil Company, Inc. #1; Baird Petroleum Equipment Corporation; Harris Oil Company, Inc.; Emmart Oil; Highland Tank & Manufacturing Company #11; James Islintu; R.L. Smiltz Oil Company, Inc.; Albright Oil, Inc.; Howard Gasoline & Oil Company; Shelving Installation Service, Inc.; First State Petroleum Services, Inc. #2; K & T Pump & Tank, Inc.; DePue Oil Company; NECO Equipment Company; Franklin Oil Company, Inc. #2; Allan U. Bevier, Inc.; Highland Tank & Manufacturing Company #12; Charles A. Frey; Oil Repair & Installation Company, Inc.; Delmarva Tank Specialists, Inc.; Smiles Are For Free - Everything Else is C.O.D.; Highland Tank & Manufacturing Company #13; Richard D. Galli; Goode Omega, Inc.; Tate Instrumentation & Controls

4. Fargo Tank Company; Highland Tank & Manufacturing Company #1; Luther P. Miller, Inc.; Toot-N-Scoot: A Division of Best Oil Inc.; Boulder Oil Company; Dean Fowler Oil Company; Lou Korchak Oil Company, Inc.; John W. Kennedy Company, Inc. #1; Emmart Oil Company; Enercon Services, Inc.; Midstate Fuel Storage Systems; Interface Services, Inc. #1; Alaskan Oil; Clemett & Company; Interface Services, Inc. #2; JEMKO Petroleum Equipment, Inc.; Earl "Jerry" Galvin Manufacturers Representative; Environmental & Energy Systems Company #1; Carlucci Construction Company, Inc.; Environmental & Energy Systems Company #2; Oil Equipment Sales, Inc.; Fedco Manufacturing

Corporation; JABE Construction & Equipment Inc.; Barkman Oil Company Inc.; Environmental & Energy Systems Company #3; Miller's Petroleum Systems, Inc.; Tiger Fuel Company; H.J. Tanner, Inc.; Northeast Mechanical Corporation; Glider Oil Company; EnviroReps, Inc.; HOBBS Inc. #1; Advanced Pollution Control; HOBBS Inc. #2; Parker & Associates, Inc.; Fedco Petroleum Installations, Inc.; Kelley Omega, Inc.; Fedco Tank and Equipment, Inc.s; Center Point Tank Services, Inc.; C & S Contractors & Equipment, Inc.; Mon Valley Petroleum Company; Northrup Supply Corp.; Environmental & Energy Systems Company #4; J & J Marts, Inc. Mountaineer Mart; Gary Dyer Excavating Company, Inc.; Purvis Brothers, Inc.; Everybody's Oil Corporation; Alaskan Oil Inc.; Coldiron Fuel, Inc.; Griffith Oil Company; C. Arlo Cummins; John W. Kennedy Company, Inc. #2; Bettiol Fuel Service, Inc.; Ravenna Oil Company; Pet-Chem Equipment Corp.; Leake Oil Company; Cuyahoga Landmark Petroleum Services; Varouh Oil, Inc.; The Lyden Company; Cross Oil Corporation; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; M&M Oil Company, Inc.; The Coen Company; Petroleum Equipment Services, Inc.; James A. Grogey; Worth & Company, Inc.; A. Graziani & Company, Inc.; Highland Tank & Manufacturing Company #5; Whitelock and Woerth, Inc.; McKenzie Group, Inc.; Voegele Mechanical, Inc.; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Joseph Stong, Inc.; Quality Petroleum Systems, Inc.; Beck Suppliers, Inc; Lechmanik, Inc.; Ward's Pump and Tank; Edward J. Meloney, Inc.; Valley Equipment Company, Inc. #1; Grace Oil Company; Republic Oil Company, Inc.; Valley Equipment Company, Inc. #2; Humb Remodeling & Equipment; Jack Hirsch; Hirri Service Company; Black Equipment, Inc.; Professional Petroleum Service Company; TJ Equipment Company; United Environmental Group Inc.; Cernak Tank Company, Inc.; United Marketing, United Refining Company of Pennsylvania; Petro Tech Electronics Inc.; Trombold Equipment Company; G.E. Sell, Inc.; Steven J. Tornabine; Crawford Fuel & Oil; Holmes Oil Company; Young Equipment Division; Marshall Farms, Inc.; M&E Anderson Equipment & Testing; Laurel Valley Oil Company; E.E. Wine, Inc.; Rice Christ, Inc. #1; Rice Christ, Inc. #2; Rice Christ, Inc. #3; Eastern Petroleum Services, Inc.; Ullman Oil, Inc.; Carl Mundy Contractors #1; James Nichols; Tri-State Petroleum Corporation #1; Petroleum Services, Inc.; Ten Hoeve Brothers, Inc. #1; Carl Mundy Contractors #2; Kay Bibih; Tess Bechtold; D.T. O'Connor, Inc.; Penzoil Products Company; Carl Mundy Contractors #3; Joe DeFazio Oil Company; Childers Oil Company; J.H. Crosier Company; Highland Tank & Manufacturing Company #6; Benit Fuel Sales & Service Inc. #2; Bell Petroleum Ltd., Aviation Products Division #2; Highland Tank & Manufacturing Company #7; Herman Goldner Company, Inc.; A.C. & T. Company, Inc.; Caledonia Oil Company #1; Caledonia Oil Company #2; Mountain State Bit Service, Inc.; SICO Company; Caledonia Oil Company #3; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Alliance Oil Service Company; Cortland Pump & Equipment Company; Bedford Valley Petroleum Corporation; Coastal Pump & Tank, Inc.; First State Petroleum Services, Inc. #1; Willison Oil, Inc.; Petroleum Industry Consultants, Inc.; Tri-State Petroleum Corporation #2; Sammie Huff Contractors, Inc. Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Lane & Clark Mechanical Contractors, Inc.; Craig K. William; Joseph Goffrey; Oil Equipment Sales & Service Company, Inc. (OESSCO); APCON Environmental Services, Inc.; Franklin Oil Company, Inc. #1; Harris Oil Company, Inc.; Emmart Oil; Highland Tank & Manufacturing Company #11; R.L. Smiltz Oil Company, Inc.; Albright Oil, Inc.; Howard Gasoline & Oil Company; Shelving Installation Service, Inc.; First

State Petroleum Services, Inc. #2; K & T Pump & Tank, Inc.; DePue Oil Company; NECO Equipment Company; Franklin Oil Company, Inc. #2; Allan U. Bevier, Inc.; Charles A. Frey; Oil Repair & Installation Company, Inc.; Delmarva Tank Specialists, Inc.; Smiles Are For Free - Everything Else is C.O.D.; Highland Tank & Manufacturing Company #13; Richard D. Galli; Goode Omega, Inc.; Tate Instrumentation & Controls

5. This commenter supports monitoring of the cathodic protection system immediately following installation an excavation disturbances or retrofit activities.

6. Fargo Tank Company; Highland Tank & Manufacturing Company #2; John W. Kennedy Company, Inc. #1; Highland Tank & Manufacturing Company #3; JEMKO Petroleum Equipment, Inc.; Oil Equipment Sales, Inc.; Northeast Mechanical Corporation; EnviroReps, Inc.; Advanced Pollution Control; Parker & Associates, Inc.; Fedco Tank and Equipment, Inc.; John W. Kennedy Company, Inc. #2; Pet-Chem Equipment Corp.; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; Highland Tank & Manufacturing Company #5; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Quality Petroleum Systems, Inc.; Hirri Service Company; Professional Petroleum Service Company; TJ Equipment Company; James B. Phillips Company, Inc.; Trombold Equipment Company; Crawford Fuel & Oil; Young Equipment Division; Ten Hoeve Brothers, Inc. #1; D.T. O'Connor, Inc.; Bell Petroleum Ltd., Aviation Products Division #1; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Throlup; Benit Fuel Sales & Service Inc. #1; Highland Tank & Manufacturing Company #7; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Baird Petroleum Equipment Corporation; James Islintu; NECO Equipment Company; Allan U. Bevier, Inc.; Charles A. Frey; Tate Instrumentation & Controls

ENCLOSURE 4

RECOGNIZED STANDARDS FOR CATHODIC PROTECTION MONITORING

Organization	Citation	Criteria	Initial Monitoring	Monitoring Interval
NACE International, formerly National Association of Corrosion Engineers	RP-02-85 (1985)[1] §10.2, 10.3	-0.85V	When the system is energized	Annually
Canadian Council of Ministers of the Environment (CCME)	CCME EPC-LST-61E (1993) §4.9.2(4), 6.4.1(2)	-0.85V	After installation	Annually
National Standard of Canada	ULC CAN4-S603.1-M85 (1985) §A1.4, B3.12.3.1, B3.12.4.1	-0.85V	After backfilling and before commencing paving	After the first 12 months of installation and every two years thereafter
Petroleum Equipment Institute (PEI)	PEI/RP 100-94 (1994) §10.13, 12.2	-0.85V	Before placing UST system in service. If system fails, facility may operate, but test should be repeated in 90 days and repaired if needed	Not specified
American Petroleum Institute (API)	API RP #1632 (1987) §3.6.6	-0.85V	6 to 12 weeks after installation and one year thereafter	Every 5 years. If underground work is performed at the site, 6 to 12 weeks after completion and one year thereafter before extending interval to 5 years.
National Fire Protection Association (NFPA)	NFPA 30 (1993) §2-4.3		A cathodic protection system should be engineered, installed and maintained in accordance with recognized standards of design such as: API 1632, ULC-S603.1 M, Steel Tank Institute Standard No. sti-P3, NACE RP-01-69 (1983), NACE RP-02-85 (1985)	
Uniform Fire Code (UFC)	1991 §79.603		At installation	Not less than once every five years

RECOGNIZED STANDARDS FOR CATHODIC PROTECTION MONITORING (cont.)

Organization	Citation	Criteria	Initial Monitoring	Monitoring Interval
Department of Transportation (DOT)	49 CFR §192.455 to §192.477, Appendix D	-0.85V	For pipelines installed after July 31, 1971, cathodic protection system must be installed and placed in operation within one year of construction. For pipelines installed prior to August 1, 1971, each area that has an effective external coating must be cathodically protected.	Cathodic protection for each pipeline must be tested once a year at intervals not exceeding 15 months. Each rectifier must be inspected six times a year at intervals not exceeding 2 5 months. For pipelines transporting corrosive gas, each means of monitoring internal corrosion must be checked twice yearly at intervals not exceeding 7.5 months. Each reverse current switch, diode and interference bond whose failure would jeopardize protection must be checked six times a year at intervals not exceeding 2.5 months.
Environmental Protection Agency	40 CFR §264.195	-0.85V	For tanks storing or treating hazardous wastes, inspection of the cathodic protection system must be performed within six months of installation	The cathodic protection system must be inspected annually after the initial inspection. All sources of impressed current must be inspected and/or tested at least every 60 days. Guidelines for inspections may be found in NACE RP-02-85 and API 1632. Results of inspections must be kept in facility operating record.
Environmental Protection Agency	40 CFR §280.31	-0.85V	For all steel UST systems with corrosion protection, inspection of the cathodic protection system must be performed within six months of installation by a qualified cathodic protection tester	The cathodic protection system must be inspected every three years after the initial inspection. UST systems with impressed current cathodic protection systems must be inspected every 60 days to ensure that the equipment is running properly. Guidelines for inspections may be found in NACE RP-02-85 and API 1632. Records must be maintained of the last two inspections for cathodic protection systems, and the last three inspections for impressed current cathodic protection systems.

1. Work is underway on a revision to this Recommended Practice, which when completed may not specify a monitoring interval. Anticipated date is 1995.

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